
SEPARATOR


54-00068


HAZ WASTE


COMPLIANCE


03/2003

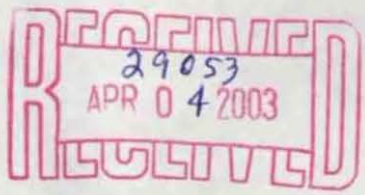

NA


9542231

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

April 2, 2003

Mr. Daniel Clanton, Engineering Supervisor,
Active Sites Branch, Hazardous Waste Division
Arkansas Department of Environmental Quality
8001 National Drive
Little Rock, Arkansas 72219



Dear Mr. Clanton:

EPA Region 6 contractors have completed a conceptual site model (CSM) on Cedar Chemical Corporation (ARD990660649) in West Helena, Arkansas and the Colonel Factory's Outlet sites in West Memphis (ARD035663301) and Crawfordsville (ARD000003897), Arkansas. As part of our efforts to expedite the completion of our GPRA goals for RCRA facilities in Region 6, we have made efforts to use contractor support for facilities that have been identified as having low financial resources.

With the completion of the CSM, we now have useful information in one document to ascertain the status of the facility with respect to exposures to human health (CA725) and the migration of contaminated groundwater (CA750). Please note that there is a section in the CSM known as the "Data Gaps" section. In this section, the contractors have delineated the needed information for obtaining answers for the completion of the CA725 and CA750 forms. As we discussed, if ADEQ determines that sampling at these sites is necessary, the contractors may be further instructed to use the Data Gaps section to create a Sampling Analysis Plan (SAP) for the collection of analytical data.

Please contact me if you have any questions or concerns with the enclosed reports.

Sincerely,

Nancy Fagan

Nancy Fagan,
EPA Work Assignment Manager
Multimedia Planning and Permitting

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FIGURES

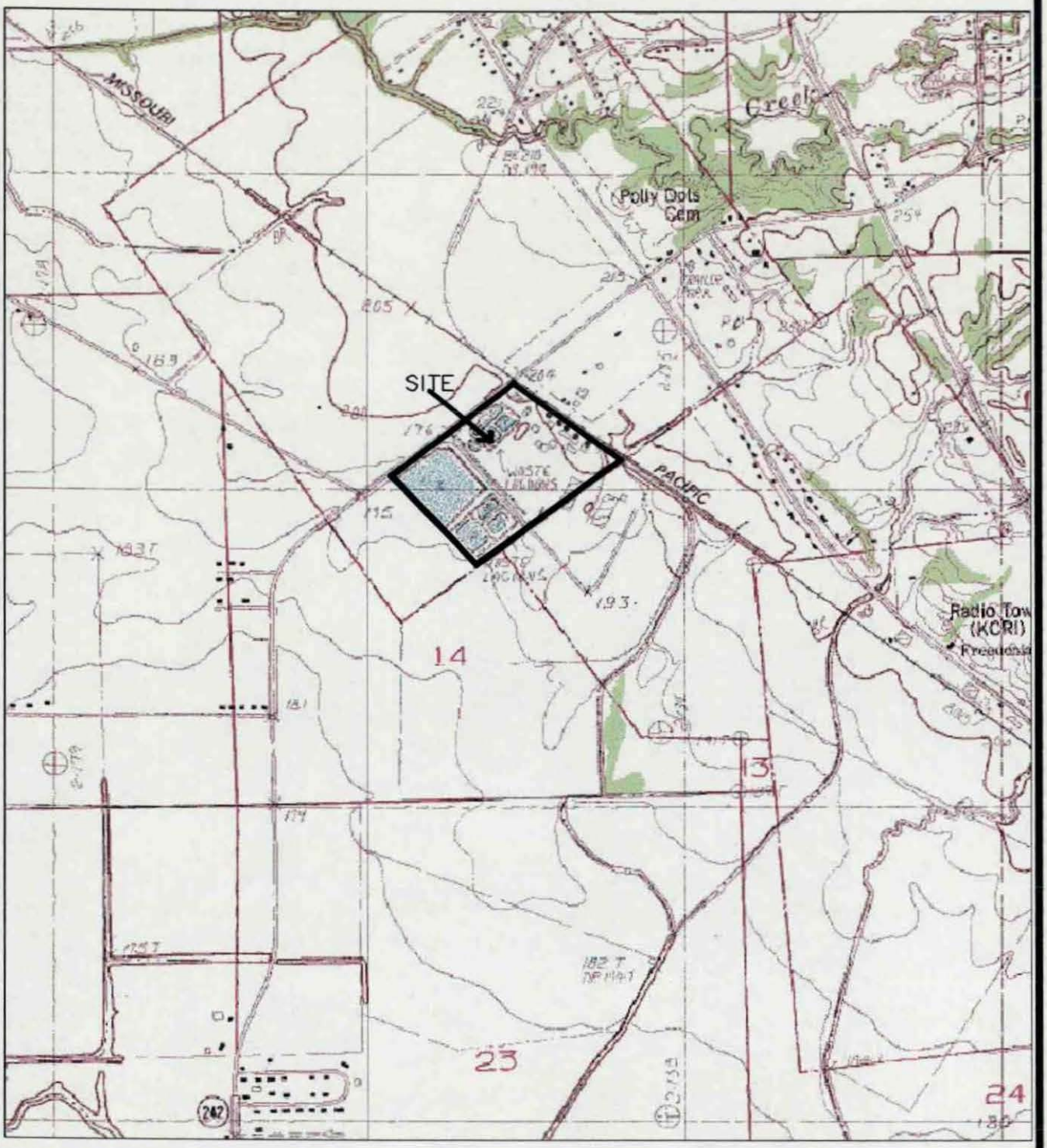
FACILITY PROFILE

I. FACILITY PROFILE

1.0 Facility Description

The Cedar Chemical Corporation (CCC) West Helena Plant is located to the south of Helena and West Helena, Arkansas. The plant is located on 48 acres of the Helena-West Helena Industrial Park, approximately one and one quarter mile southwest of the intersection of U.S. Highway 49 and State Highway 242, as shown on Figure 1. The plant is bordered by farms, State Highway 242, the Union-Pacific Railway, and other industrial park properties. Residential areas are located within one-half mile to the southwest and northeast of the CCC site (Environmental and Safety Designs, 1996).

The CCC plant property is divided into two major areas: the manufacturing area and the wastewater treatment system area. Agricultural and organic chemicals including insecticides, herbicides, polymers, and organic intermediates were manufactured within six production units at the facility. In addition to chemical production, plant activities included product formulation and packaging. Chemical production occurred in batches and fluctuated based on the season. New products were frequently introduced into production. Production Units 1 and 4 manufactured various custom products, Production Unit 2 produced propanil, Production Unit 5 manufactured nitroparaffin derivatives, and Production Unit 6 produced dichloroaniline. Production Unit 3 manufactured herbicides (RP-10), benzene sulfonyl chloride, alkylated phenol, and methylthiopinacolone oxide (MTPO) until it was destroyed in an explosion and fire on September 26, 1989. Chemical processing at the production units included alkylation, amidation, carbamoylation, chlorination, distillation, esterification, acid and base hydrolysis, and polymerization (Environmental and Safety Designs, 1996).



LOCATION MAP OF CEDAR CHEMICAL
WEST HELENA, ARKANSAS (WEST HELENA QUAD–1988)
FIGURE 1

Date: JANUARY 27, 2003

Drawn By: AER

BOOZ|ALLEN|HAMILTON

230 Peachtree Street N.W. Suite 2100
Atlanta, Georgia 30303
(404) 659-3600 FAX (404) 589-7050

NOT TO SCALE
(Based on 1:25,000 scale)

In 1972, the facility began dumping waste chemicals into three unlined earthen ponds surrounded by berms at the site. The dimensions of two of the ponds were approximately 120 feet by 150 feet. These two ponds were used for waste disposal. The third pond was approximately 120 feet by 30 feet and limestone was added to this pond for acid neutralization. Wash water from Helena Chemical Company's chemical formation operations was also discharged to these ponds. Helena Chemical discontinued disposal of wastes in the ponds around 1977. A wastewater treatment system was constructed at the facility in 1977 for treatment of wastewater formerly discharged to the ponds. The wastewater treatment system consisted of an API separator (Solid Waste Management Unit (SWMU) 62), flow equalization basin (SWMU 64), aeration basin (SWMU 65), two clarifiers (SWMUs 66 and 67), and a polish pond (SWMU 68). In 1978, the ponds were closed by pumping the water from the ponds and installing clay/bentonite cap over them (EPA, 1988).

CCC is currently going through bankruptcy and manufacturing operations were shut down on March 8, 2002. As of June 2002, only 21 personnel were working at the facility on 10 hour work days, Monday through Thursday (ADEQ, 2002).

2.0 Site History

In 1970, Helena Chemical Company acquired the site for construction of a propanil and methyoxychlor manufacturing facility. In 1971, the plant was sold to Jerry Williams, who transferred the plant to a newly formed corporation – Eagle River Chemical Corporation, which was initially controlled by Ansul Company. Under Ansul's management, the plant was converted for production of dinitorobutylphenol (dinoseb). In 1973, Jerry Williams purchased the Eagle River Chemical Corporation, and retained the name Eagle River Chemical. Subsequently, the Eagle River Chemical Corporation merged into the Vertac Chemical Corporation. In 1986, the plant was sold to Cedar Chemical Corporation, which currently owns the facility (Environmental and Safety Designs, 1996).

3.0 Regulatory Status

In November 1980, Vertac Chemical Corporation filed a Resource Conservation and Recovery Act (RCRA) Part A permit application with the Arkansas Department of Pollution Control and Ecology (ADPCE). Subsequently, interim status was granted for a hazardous waste storage tank, a hazardous waste container storage area, and a biological treatment lagoon. Vertac submitted a RCRA Part B application on August 15, 1984. In November 1984, Vertac Chemical Corporation requested that the biological treatment lagoon be removed from the list of interim status facilities requiring a RCRA permit because the system was not used to treat hazardous waste. ADPCE approved this request on November 16, 1984 (ADPCE, 1984). CCC submitted a revised RCRA Part A permit on March 1, 1986. The two storage units were RCRA closed in 1988, with no post-closure care required. Thus, the Part B application was not processed and a RCRA permit was not issued.

On May 30, 1986, ADPCE conducted a compliance evaluation inspection (CEI) and observed violations. As a result, ADPCE issued a notice of violation on December 19, 1986, indicating that CCC was disposing of hazardous waste to the biological treatment ponds and that a sump pump within the container storage area was broken at the time of the CEI. Subsequently, Consent Administrative Order (CAO) No. LIS 86-027 was issued on July 16, 1987, to CCC, which essentially required them to stop disposing of hazardous waste to surface impoundments and investigate potential release(s) to surrounding media.

On June 26, 1990, CCC was informed of a violation that was observed during another CEI. The violation involved the disposal of monitoring well purge water directly onto surface soil.

ADPCE issued CAO No. LIS 91-118, requiring CCC to conduct a facility investigation (FI). Field activities for Phase I of the FI began on August 30, 1993. Two additional phases (Phase II and III) of the FI were conducted in 1994 and 1995, respectively. In 1996, a FI report was

submitted that summarized all three phases of the FI and recommended that additional sampling be conducted as part of a corrective measures study (CMS).

On May 5, 1993, ADPCE conducted a CEI and violations were observed. The CEI report indicated that CCC failed to determine if a solid waste was hazardous waste in accordance with 40 CFR 262.11 and failed to comply with the requirement of personnel training in accordance with 40 CFR 262.34(a)(4).

On May 27, 1998, Arkansas Department of Environmental Quality (ADEQ), the successor agency to ADPCE, conducted a CEI and observed violations. The CEI report indicated that CCC had been accumulating hazardous waste for more than 90 days in an unpermitted unit. Subsequently, ADEQ issued CAO No. LIS 99-131, which required CCC to achieve and maintain compliance with Arkansas state regulations.

On June 4, 2002, ADEQ conducted a CEI and noted that CCC had been accumulating hazardous waste for more than 90 days in an unpermitted unit and relinquished hazardous waste to an unpermitted transporter. In an August 14, 2002 letter, ADEQ required that CCC submit manifests to ADEQ for the waste was being shipped off-site by a permitted transporter and to a permitted treatment, storage, and disposal facility (TSDF).

All surface water runoff from the facility is directed to the storm water drainage system (SWMU 59). This system drains into the storm water sump (SWMU 60). When the capacity of the sump is exceeded, the system drains to National Pollutant Discharge Elimination System (NPDES)-permitted Outfall #001. This outfall drains to the industrial park ditch adjacent to the facility. The industrial park ditch drains to Beaver Bayou, eventually discharging to Big Creek and the White River. Effluent from the wastewater treatment system is pumped off site through a 4.5-mile pipeline to NPDES-permitted Outfall #002, where it is discharged directly into the Mississippi River. NPDES Permit AR0036412 was issued to CCC in September 1985 and

renewed in September 1990. Available file materials indicated the permit was due to expire in October 1995 and did not indicate whether the permit was subsequently renewed.

4.0 Process Description

Production Unit 1

Permethrin and cypermethrin, two synthetic pyrethroid insecticides, were manufactured at this production unit. Permethrin acid chloride and an aromatic alcohol/solvent mixture were added to a reactor and subsequently processed in a wash and surge vessel. The solvent was then removed to produce the technical grade permethrin product. For cypermethrin production, acid chloride, aromatic aldehyde, a solvent, a catalyst, and sodium cyanide were added to a reactor and then processed in a wash and surge vessel. The solvent was then removed resulting in the final cypermethrin product. A block flow diagram of permethrin and cypermethrin production was provided in Exhibit 2-7 and 2-8 of the RCRA Facility Assessment (RFA) (EPA, 1988).

The FI Preliminary Report indicated that methylthiopinacolone oxide (MTPO), telene rim resin, methyl ethyl sulfide, and 1-(carboethyoxy)ethyl-3-[2-(triflouromethyl)phenoxy]benzoate were also manufactured at this production unit (Environmental and Safety Designs, 1992). Details regarding the formulation of the aforementioned chemicals at this production unit were not found in the available file material.

Production Unit 2

Propanil (3,4-dichloropropionanilide), a rice herbicide, was manufactured at this production unit. The propanil product was derived by reacting 3,4-dichloroaniline, propionic acid, and propionic anhydride. A block flow diagram of propanil production was provided in Exhibit 2-9 of the RFA (EPA, 1988).

Production Unit 3

The RFA indicated that this production unit manufactured herbicides (RP-10), benzene sulfonyl chloride, alkylated phenol, and MTPO (EPA, 1988). The FI Preliminary Report indicates that Isonox 132 (2,6-di-tert-butyl phenol) was also manufactured at this production unit (Environmental and Safety Designs, 1992). Details regarding the formulation of the aforementioned chemicals at this production unit were not found in the available file material.

Production Unit 4

A methomyl insecticide product (lannate) was formulated for DuPont at this production unit in 1979 and 1980. From 1983 to 1985, a variety of arsenic-based herbicides were formulated and packaged including monsodium methanearsonate, disodium methanearsonate, VERSAR-600, VERSAR-660, Bulls-Eye, Broadside, and Phytar-560. A chemical intermediate (RP-15) also was manufactured from September 1986 through December 1986. The FI Preliminary Report indicates that MTPO, ORFOM D-8 (petrosulfur mixture), ORFOM CO300 (allyl n-butyl trithiocarbonate), methyl 2-benzimidazole carbamate, methyl ethyl sulfide, diethylhexyl phosphoric acid, p-nitrotoluene, dichloronitrotoluene, and 2-chloro-4-nitrotoluene were also manufactured at this production unit (Environmental and Safety Designs, 1992). Details regarding the formulation of the aforementioned chemicals at this production unit were not found in the available file material.

Production Unit 5

A polymer product, a drag reduction agent (DRA), was manufactured under contract with Atlantic-Richfield from 1980 to 1985 at this production unit. The FI Preliminary Report indicates that tris(hydroxymethyl)aminomethate (TA), 2-amino-butanol, and 2-amino-2-propanol were also manufactured at this production unit (Environmental and Safety Designs, 1992). Details regarding the formulation of the aforementioned chemicals were not found in the available file material.

Production Unit 6

The FI Preliminary Report indicates that 3,4-dichloroaniline was manufactured at this production unit (Environmental and Safety Designs, 1992). Details regarding the formulation of the 3,4-dichloroaniline were not found in the available file material.

PHYSICAL PROFILE

II. PHYSICAL PROFILE

1.0 Climate

Arkansas has a humid mesothermal climate that is typical of the southeast and south-central United States. The mean annual precipitation is 50 inches, and the maximum precipitation occurs between February and April. The mean annual temperature is 62.7 °F. The prevailing wind direction is to the southwest at an average speed of eight miles per hour (mph) and travels in that direction 12.3 percent of the time (Environmental and Safety Designs, 1996).

2.0 Topography and Surface Water

CCC is located approximately two miles west of the Mississippi River within the Mississippi Embayment Region of the Gulf Coastal Plain. The topography of the land is relatively flat with gentle slopes oriented to the southeast. Ground surface elevations at the site vary from approximately 188 feet above mean sea level (msl) in the southwest to 200 feet above msl in the northeast (Environmental and Safety Designs, 1996).

Surface runoff generally flows toward the southeast and the Mississippi River. Localized changes in topographic relief are attributable primarily to anthropogenic alterations made for construction, or for directing surface water runoff. Because the topography of the region is relatively flat, overland flow velocities are low and some areas where the original ground surface has not been modified are poorly drained. To improve drainage, unlined storm water drainage ditches have been constructed to divert runoff water to retention and treatment basins. CCC is not in the 100-year floodplain of the Mississippi River (Environmental and Safety Designs, 1996).

3.0 Soils

The upper six feet of soils at the site were described and classified as the Convent Series. This soil series is comprised of somewhat poorly drained, level soil that develops on alluvial fans at the foot of Crowley Ridge, which is a major regional structural feature. The soil of the Convent Series is characterized by medium-to-low organic matter content, moderate permeability, and high available water capacity. The Convent Series is predominantly made up of friable silt loam with granular structure, roots, and organic matter present at the uppermost horizon. Underlying this layer exists a series of horizons comprised of silt loam parent material with platy structure and mottling that increases in abundance and distinction with depth (Environmental and Safety Designs, 1996).

4.0 Geology

4.1 Regional Geology

The surficial and near surficial soil consists of alluvial deposits of fine grained sands and silt from the Quaternary Age. The Quaternary alluvium in eastern Arkansas is generally comprised of an upper layer of silt and clay and a bottom layer of sand and gravel. The alluvial deposits are approximately 150 feet thick. The alluvium is typically the surface stratum in this region, except where Tertiary formations, such as Crowley's Ridge, outcrop. The bottom of the Quaternary deposits sit on the erosional surface of older Cretaceous and Tertiary formations (Environmental and Safety Designs, 1996).

Underlying the alluvial deposits is the undifferentiated Jackson-Claiborne Group of the Tertiary Age. The Jackson-Claiborne Group serves as a confining bed, as it is chiefly composed of clay with find sand lenses; no water is produced from this stratum. The Claiborne Group is predominantly silty clay with thin, discontinuous beds of silty clay and lignite. The Jackson Group is generally made up of gray, brown, and green silty clay with peat and lignite. In the

vicinity of the site, the Jackson Clay is approximately 250 feet thick (Environmental and Safety Designs, 1996).

The lowermost geologic unit of concern at the site is the Sparta Sand. The Sparta Sand is comprised of primarily gray, very fine to medium sand with brown and gray sandy clay. This formation is likely to have been a beach deposit of a transgressing sea and ranges in thickness from 300 to 400 feet. The Sparta Sand serves as the major deep source of potable groundwater in the Helena/West Helena area (Environmental and Safety Designs, 1996).

4.2 Site Geology

The general stratigraphic succession beneath the site from surface to depth include surface soil and loess within fluvial alluvium, fluvial alluvium aquifer deposits (coarsening downward), Jackson Clay Group, and Sparta Sand. The primary focus of the 1993 FI field activities was the sampling of the alluvial deposits. Based on the sampling of the alluvium, five separate stratigraphic units were identified within the alluvial section beneath the site. Field activities involved only minimal sampling of the Jackson Clay, with no sampling of the Sparta Sand (Environmental and Safety Designs, 1996).

During FI field activities, five distinct units were observed at the site. A fining upward sand and gravel sequence from the surface of the Jackson Clay was present at approximately 135 to 150 feet below ground surface (bgs). Overlying this unit is a fining upward sand sequence, ranging from a poorly sorted coarse sand, at 135 feet bgs, to a very fine silty sand at the top of the sequence, at approximately 40 feet bgs. Lignite and organic matter are associated with this alluvial unit. From the top of the alluvial sands to the ground surface, an interbedded, very stiff to firm, tan, gray, and brown silty clay and clayey silts were encountered. The silty clays and clayey silts were addressed as two distinct units during the FI field activities. The lower of the two units overlies the alluvial sands and gravels. This unit consists of a tight, gray to olive-gray clay with silt ranging from approximately 15 to 20 feet thick. This clay unit acts as a

semiconfining unit at the site due to its low permeability rate; the contact between this semiconfining unit and the alluvial sands serves as a distinct layer. The second of the two units is surficial sediment comprised of a light brown to brown silt and silty clay layer extending from the surface of the gray clay to the ground surface. The contact between the semiconfining unit and the surficial sediments is another distinct layer observed within the alluvial deposits. (Environmental and Safety Designs, 1996).

5.0 Groundwater

The site is underlain by several units of unconsolidated Quaternary and Tertiary Age sedimentary deposits. Two aquifer regimes exist at the site, including a minor discontinuous perched zone in the silt and clay surficial sediments and the primary alluvial aquifer in the sand and gravel zone. The discontinuous perched zone was identified at Sites 1 and 2 (refer to Release Profile for information on these Sites) in disturbed soil or fill overlying a surficial clay unit; water was encountered between 10 and 20 feet bgs. Perched groundwater was not encountered on top of the clay in the northern portion of the site. The clay unit is approximately 10 to 20 feet thick (Environmental and Safety Designs, 1995).

The alluvial aquifer ranges from 30 to 40 feet bgs to approximately 150 feet bgs, where it contacts the Jackson-Claiborne Group stratum of clay and lignite materials. The alluvial aquifer is comprised of silty sand, sand, and fine to coarse grained gravel. Locally, the aquifer appears to be confined by the upper 40 feet of silt and clays, and acts as a confined or semiconfined aquifer. The Jackson Clay is the basal confining unit for the alluvial aquifer in this region of Arkansas (Environmental and Safety Designs, 1995).

The alluvial aquifer is a major source of groundwater for agricultural use in eastern Arkansas. The alluvial deposits provide groundwater for irrigation wells in the areas surrounding Helena and West Helena, Arkansas. The irrigation wells are reportedly capable of producing approximately 1,000 gallons per minute (gpm). Domestic and municipal water supplies are

typically obtained from the Sparta Sand/Memphis Sand aquifer system, which underlies the Jackson-Claiborne Group. Regional groundwater flow in the Sparta Sand is generally to the southeast toward the Mississippi River (Environmental and Safety Designs, 1996).

ECOLOGICAL PROFILE

III. ECOLOGICAL PROFILE

1.0 Description of Habitats

Three ecological areas of concern were identified in the 1999 Risk Assessment. Area I consists of three ditches on site that make up the storm water retention system. Area II consists of an approximately two-acre isolated wetland located on the southwest boundary of the plant property. Area III includes all adjacent off-site non-industrial areas (Ensafe, 1999).

It should be noted that although three ecological areas of concern were identified in the 1999 Risk Assessment, only one area (Area I) was evaluated in the risk assessment because no relevant data (surface soil, sediment, or surface water) were collected at Areas II and III (Ensafe, 1999).

1.1 On-Site Habitats

Area I consists of three on-site ditches that served as a storm water retention system, which is a component of the wastewater treatment system. These open ditches are vegetated with various grasses along the edges, and submergent plants are present in more frequently submerged portions. During the June 4, 1999 ecological survey, two species of tadopoles (Bullfrog [*Rana catesbeiana*] and Southern Leopard [*Rana utricularia*]) were observed in the ditches. Two species of birds were also feeding in and around the ditches. The Killdeer (*Charadrius vociferus*), which is a farm country plover, usually inhabits fields, airport, lawns, river banks, and shores. In addition, the Green Heron (*Butorides striatus*), which feeds on a variety of fish, frogs, crawfish, insects, and other aquatic life, was identified (Ensafe, 1999).

Area II consists of a two-acre isolated wetland constructed in 1978 to serve as an overflow retention pond for the wastewater treatment system. Once the pond was excavated it was determined that an overflow system was not necessary; therefore, a connection between the treatment system and ponds was never installed. Over the years the excavated area developed

wetland characteristics through natural secession and now meets the U.S. Army Corps of Engineers (USACE) definition of a wetland. The dominant wetland vegetation consists of Black Willow (*Salix nigra*), Chickasaw Plum (*Prunus anjustifolia*), common Cattails (*Typha latifolia*), Floating Primrose Willow (*Ludwgia spp.*) and duckweed (*Lemna spp.*) (Ensafe, 1999).

1.2 Off-Site Habitats

Area III includes all off-site non-industrial areas within one mile of the facility. These areas include agriculture farm lands, ditches, and tributaries to Big Creek. Approximately 99 percent of Area III is cultivated with cotton, soybeans, or winter wheat. The tributaries discharge to Big Creek approximately 15 miles southeast of the facility (Ensafe, 1999).

2.0 Description of Receptors

According to the 1999 risk assessment, there are 16 State and Federal listed threatened and endangered species in Phillips County; however, none of these species have been identified at or in the general vicinity of the CCC site (Ensafe, 1999).

3.0 Summary of Ecological Profile with Respect to Exposure Potential

Arsenic, aldrin, dieldrin, 4,4'-dichlorodiphenyldichloroethylene (4,4'-DDE), 4,4'-dichlorodiphenyldichloroethane (4,4'-DDD), 4,4'-dichlorodiphenyltrichloroethane (4,4'-DDT), endrin, gamma-BHC, methycychlor, and toxaphene were detected in sediment at Area I above the EPA Region 4 sediment screening values. Two potential receptors were identified in the 1999 Risk Assessment–these were tadpoles and piscivorus birds. Tadpoles in the ditches may potentially be exposed to contaminated sediment identified in the ditches. Because of the nature of contamination in sediment, bioaccumulation is possible. In addition, piscivorus birds may also ingest tadpoles with elevated levels of pesticides. However, the 1999 Risk Assessment indicates the potential risk in Area I was considered acceptable because the ditches are used as an

integral component of the facility's wastewater treatment system. Due to the function of these ditches, standing water is frequently drained and, thus, any emerging aquatic habitat was considered opportunistic (Ensafe, 1999).

No potentially complete ecological exposure pathways for Area II were identified in the 1999 Risk Assessment (Ensafe, 1999).

In Area III, an ecological potential pathway identified in the 1999 Risk Assessment included receptors exposed to contaminated groundwater during irrigation activities. However, ecological risks were not evaluated since no data was available from the irrigation wells at the time the 1999 Risk Assessment was conducted. The risk assessment indicated that only small mammals and birds species are present in Area III. The risk assessment indicated that during hot summer months when irrigation is frequent, wildlife species are likely dormant during the heat of the day and seek refuge in wooded areas. Thus, exposure to contaminated groundwater during irrigation events was not anticipated to be significant for potential ecological receptors (Ensafe, 1999).

RELEASE PROFILE

IV. RELEASE PROFILE

1.0 General Release Discussion

Groundwater monitoring wells were installed at the CCC site during various phases of investigation. Six monitoring wells (1MW-1, 1MW-2, 1MW-3, 1MW-4, 1MW-5, and 2MW-2) were installed and screened in the perched groundwater zone. Fifteen upper alluvial groundwater monitoring wells have been installed on site. These include 1MW-6, 1MW-7, 2MW-3, 2MW-4, 2MW-5, 2MW-6, 4MW-1, 4MW-3, 9MW-1, EMW-1, EMW-2, EMW-3, EMW-7, and EPZ-5. Two additional upper alluvial groundwater monitoring wells (OFFMW-2 and OFFMW-4) were installed off site and downgradient of the CCC site. Two lower alluvial groundwater monitoring wells (2MW-7 and 4MW-4) have been installed at the CCC site and two lower alluvial groundwater monitoring wells (OFFMW-1 and OFFMW-3) were installed off site and downgradient of the CCC site. The monitoring well locations are provided in Figures 1 and 2 of the Groundwater Monitoring Report dated September 21, 2001 (Ensafe, 2001).

To date, a groundwater monitoring program has not been established at the site. The most recent groundwater sampling event was conducted in July 2001. The groundwater data indicates that metals, pesticides, semi-volatile organic compounds (SVOCs), and volatile organic compounds (VOCs) have been detected above either the Federal Maximum Contaminant Levels (MCLs) or the EPA Region 6 Medium Specific Screening Levels (MSSLs) for Tap Water. The primary contaminants of concern, both on and off site, are 1,2-dichloroethane and arsenic. The 1,2-dichloroethane contamination is present in both the perched and alluvial groundwater zones and the contamination has extended at least one mile off site and downgradient of the CCC site. In addition, it appears arsenic contamination has co-mingled with 1,2-dichloroethane contamination, which has resulted in arsenic being relatively mobile, and has migrated along with the dissolved 1,2-dichloroethane contaminant plume.

The maximum detected concentrations in the perched groundwater zone were as follows: 8.8 µg/l of arsenic, 0.087 µg/l of beta-BHC, 0.24 µg/l of dieldrin, and 100 µg/l of 1,2-dichloroethane. The maximum detected concentrations in upper alluvial groundwater beneath the site are 603 µg/l of arsenic, 810 µg/l of benzene, 170 µg/l of chloroethane, 670 µg/l of 4-chloroaniline, 6,800 µg/l of 1,2-dichlorobenzene, 0.5 µg/l of 1,2-dichlorobenzene, 24,000 µg/l of 1,2-dichloroethane, 170 µg/l of dinoseb, 2,000 µg/l of ethylbenzene, 480 µg/l of 4-methylphenol, 760,000 µg/l of toluene, 13,000 µg/l of xylenes, and 5 µg/l of vinyl chloride. The maximum detected concentrations detected in upper alluvial groundwater off site include 13.2 µg/l of arsenic and 14,000 µg/l of 1,2-dichloroethane. The maximum detected concentration of 1,2-dichloroethane in lower alluvial groundwater beneath the CCC site was 829 µg/l. The maximum detected concentrations of arsenic and 1,2-dichloroethane in the lower alluvial groundwater off site were 14.3 µg/l and 1,400 µg/l, respectively (Ensafe, 2001).

2.0 Site Release Descriptions

Seventy-four SWMUs and two areas of concern (AOCs) were identified by EPA in the RFA. Subsequently, eighty SWMUs and three AOCs were identified at CCC in the 1992 FI Preliminary Report. However, subsequent investigations were conducted on a "Site" basis, incorporating multiple SWMUs and/or AOCs into a Site, rather than investigation by individual SWMU or AOC. Refer to Figure 2 for the location of each Site. According to the available file material, it appears that only 74 SWMUs and two AOCs were carried through to further site investigations. Table 1 summarizes each Site and the associated SWMUs/AOCs that were investigated. Historical information about each individual SWMU and AOC is provided in Section 3.0 of the Release Profile (Tables 2 and 3, respectively). The following subsections describe the releases associated with each Site.

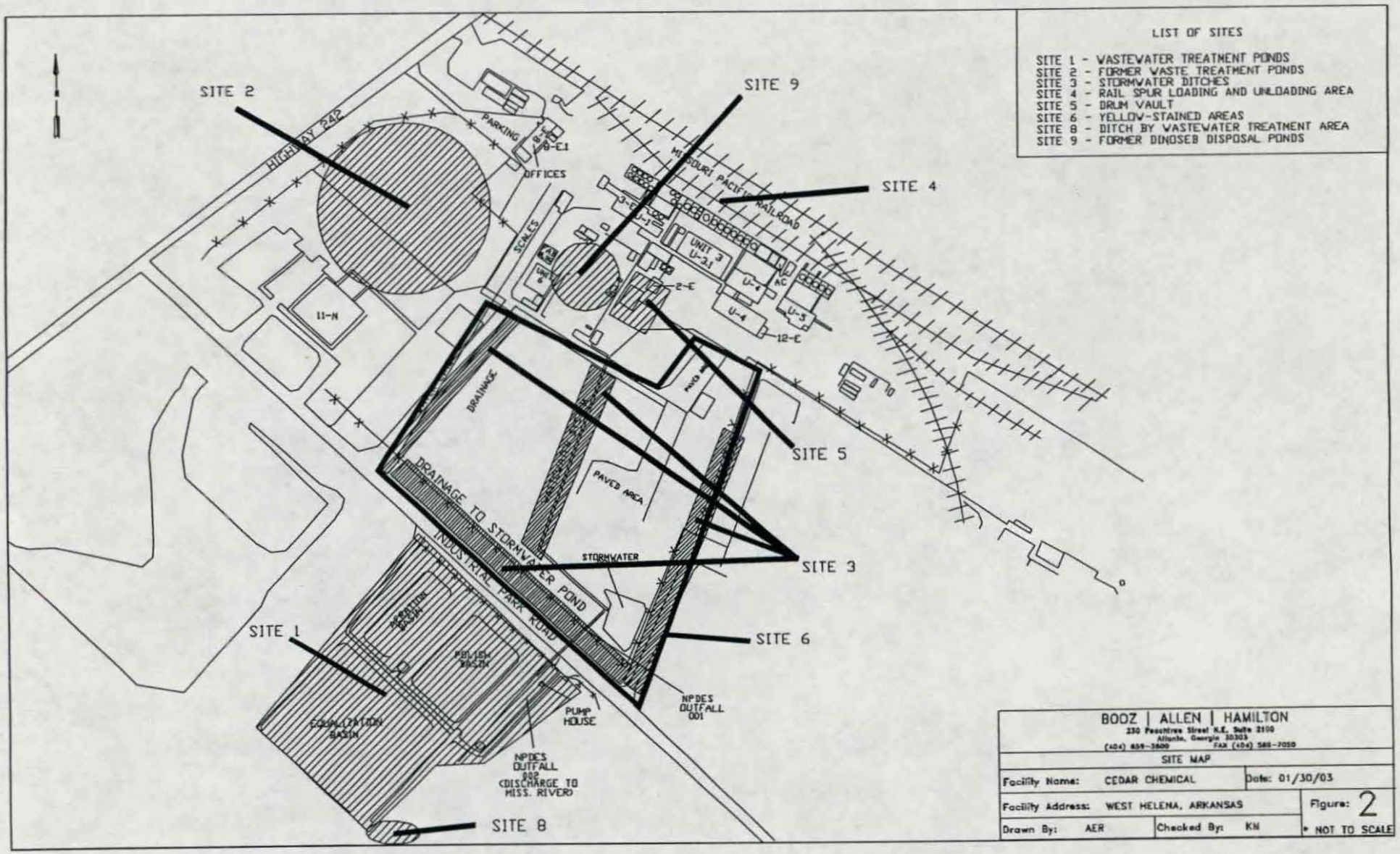

LIST OF SITES
SITE 1 - WASTEWATER TREATMENT PONDS
SITE 2 - FORMER WASTE TREATMENT PONDS
SITE 3 - STORMWATER DITCHES
SITE 4 - RAIL SPUR LOADING AND UNLOADING AREA
SITE 5 - DRUM VAULT
SITE 6 - YELLOW-STAINED AREAS
SITE 8 - DITCH BY WASTEWATER TREATMENT AREA
SITE 9 - FORMER DINOSEB DISPOSAL PONDS
SITE 2
SITE 9
SITE 4
SITE 5
SITE 3
SITE 6
SITE 1
SITE 8
HIGHWAY 242
PARKING
OFFICES
SCALES
MISSOURI PACIFIC RAILROAD
UNIT 3
U-3,1
U-4
U-5
11-N
DRAINAGE
PAVED AREA
STORMWATER
DRAINAGE TO STORMWATER POND
INDUSTRIAL PARK ROAD
AERATION BASIN
POLISH BASIN
EQUALIZATION BASIN
PUMP HOUSE
NPDES OUTFALL 001
NPDES OUTFALL 002 DISCHARGE TO MISS. RIVER
BOOZ | ALLEN | HAMILTON
230 Peachtree Street N.E. Suite 2100
Atlanta, Georgia 30303
(404) 659-3600 FAX (404) 588-7050
SITE MAP
Facility Name: CEDAR CHEMICAL
Date: 01/30/03
Facility Address: WEST HELENA, ARKANSAS
Figure: 2
Drawn By: AER
Checked By: KN
NOT TO SCALE

Table 1[1,2] Site Descriptions		
Site	**Site Name**	**SWMUs/AOCs Included**
1	Wastewater Treatment Ponds	Wastewater Tank 2 (SWMU 63), Flow Equalization Basin (SWMU 64), Aeration Basin (SWMU 65), and Polish Pond (SWMU 68)
2	Former Waste Treatment Ponds	Inactive Pond 1 (SWMU 69), Inactive Pond 2 (SWMU 70), and Inactive Pond 3 (SWMU 71)
3	Stormwater Ditches	Stormwater Drainage System (SWMU 59) and Stormwater Sump (SWMU 60)
4	Rail Spur Loading/Unloading Area	Railroad Spur Loading and Unloading Area (SWMU 74) and Railroad Loading and Unloading Sump (SWMU 3)
5	Drum Vault	Maintenance Services Drum Vault (SWMU 72)
6	Yellow Stained Areas	Yellow Stained Areas (AOC 1)
8	Ditch by Wastewater Treatment Area	Ditch by Wastewater Treatment Area (AOC 3)
9	Former Dinoseb Disposal Ponds	The site is comprised of three suspected abandoned ponds in the area between the dichloroaniline unit and the maintenance services building. These ponds were reportedly shallow, unlined basins used to dispose of off-specification dinoseb. The ponds are no longer used and have been backfilled. Buildings have also been constructed in the vicinity of the ponds, and some areas have been paved or covered with gravel. Heavy yellow staining is present on the surface soil of unpaved areas.

[1] Environmental and Safety Designs, 1996
[2] Ensafe, 1999

In the 1999 risk assessment (Ensafe, 1999), the maximum detected concentrations were compared to appropriate screening levels. Although the rationale was not provided in the risk assessment, surface soil (0-1 feet bgs) and sediment data was screened against the residential MSSLs. However, the surface/subsurface soil data (all depths) was screened against industrial MSSLs. It should be noted that the CCC site has not been redeveloped for residential use; thus, the CCC site is still considered an industrial site. After the compilation of data required in Section VI of the CSM (Data Gap Profile), all data will be re-screened using appropriate standards and documented in the Release and Risk Management Profile.

2.1 Site 1 - Wastewater Treatment Ponds

Surface soil, subsurface soil, and sediment samples were collected during Phase I FI activities. Metals, pesticides, SVOCs, and VOCs were detected in both soil and sediment. In the 1999 Risk Assessment (Ensafe, 1999), available surface soil and sediment data were screened against residential MSSLs, and surface/subsurface soil data were screened against industrial MSSLs. Maximum detected concentrations in surface soil that exceeded the residential MSSLs were as follows: 44.6 mg/kg of arsenic, 0.593 mg/kg of dieldrin, 9.6 mg/kg of dinoseb, and 7.5 mg/kg of 1,2-dichloroethane. Maximum detected concentrations above industrial MSSLs in surface/subsurface soil included: 44.6 mg/kg of arsenic, 0.593 mg/kg of dieldrin, and 7.5 mg/kg of 1,2-dichloroethane. Maximum detected concentrations in sediment above residential MSSLs included: 123 mg/kg of arsenic, 82 mg/kg of chromium, and 1,200 mg/kg of 3,4-dichloroaniline. It should be noted that the 3,4-dichloroaniline maximum detected concentration was detected above the 4-chloroaniline MSSL, which was used as a surrogate value because a MSSL for 3,4-dichloroaniline was unavailable. However, 3,4-dichloroaniline was inadvertedly excluded from the 1999 Risk Assessment, and thus, was not quantitatively or qualitatively evaluated.

2.2 Site 2 - Former Waste Treatment Ponds

During the 1993 field activities for Phase I of the FI, surface soil and subsurface soil samples were collected and analyzed. Metals, pesticides, SVOCs, and VOCs were detected in soil. In the 1999 Risk Assessment (Ensafe, 1999), surface soil data were screened against residential MSSLs, and surface/subsurface soil data were screened against industrial MSSLs. Maximum detected concentrations in surface soil that exceeded the residential MSSLs included: 0.058 mg/kg of aldrin and 100 mg/kg of dinoseb. Maximum detected concentrations above industrial MSSLs in soil included: 68.8 mg/kg of arsenic, 161.8 mg/kg of cadmium, 111.7 mg/kg of mercury, 0.5 mg/kg of aldrin, 0.350 mg/kg of dieldrin, 170 mg/kg of 1,2-dichloroethane, 0.67 mg/kg of carbon tetrachloride, 13 mg/kg of chloroform, and 380 mg/kg of methylene chloride.

2.3 Site 3 - Storm water Ditches

During the 1993 field activities for Phase I of the FI, surface soil, subsurface soil, and sediment samples were collected and analyzed. Additional sampling was conducted in Phase II and Phase III of the FI activities. Metals, pesticides, SVOCs, and VOCs were detected in sediment, and dinoseb was the only contaminant detected in soil. In the 1999 Risk Assessment (Ensafe, 1999), soil data were screened against industrial MSSLs, and sediment data were screened against residential MSSLs. Maximum detected concentrations above industrial MSSLs in soil included 13,000 mg/kg of dinoseb. Maximum detected concentrations in sediment above residential MSSLs included: 222 mg/kg of arsenic, 0.354 mg/kg of aldrin, 3.4 mg/kg of dieldrin, 1.6 mg/kg of toxaphene, and 5.3 mg/kg of pentachlorophenol.

2.4 Site 4 - Rail Spur Loading/Unloading Area

During the 1993 field activities for Phase I of the FI, surface soil and subsurface soil samples were collected and analyzed. Pesticides and VOCs were detected in soil consistently at elevated concentrations. In the 1999 Risk Assessment (Ensafe, 1999), available surface soil data were screened against residential MSSLs and surface/subsurface soil data were screened against industrial MSSLs. Maximum detected concentrations in surface soil that exceeded the residential MSSLs were as follows: 0.455 mg/kg of dieldrin and 840 mg/kg of dinoseb. Maximum detected concentrations above industrial MSSLs in subsurface soil included: 15.5 mg/kg of arsenic, 0.63 mg/kg of dieldrin, 12,000 mg/kg of 3,4-dichloroaniline, 1,100 mg/kg of dinoseb, and 0.82 mg/kg of 1,2-dichloroethane.

2.5 Site 5 - Maintenance Services Drum Vault

This site is comprised of SWMU 72, which is a concrete drum vault with a sub-floor of gravel, sand, and possibly cement located under the Maintenance Services Building. In 1993, subsurface soil samples were collected beneath the drum vault as part of the Phase I FI investigation and

dinoseb was detected beneath the vault, which CCC attributed to residual contamination from Site 9. No further action was recommended in the FI Report; however, ADPCE did not concur and required additional investigation. Subsequent to developing media-specific cleanup criteria, CCC intended to conduct additional sampling as part of a CMS.

In the 1999 Risk Assessment (Ensafe, 1999), available soil (including surface and subsurface soil) data were screened against industrial MSSLs. Maximum detected concentrations above industrial MSSLs in subsurface soil included: 9.7 mg/kg of arsenic and 170 mg/kg of dinoseb.

2.6 Site 6 - Yellow Stained Areas (Area of Concern 1)

Surface soil and subsurface soil samples were collected during Phase I FI activities. Metals, pesticides, SVOCs, and VOCs were detected in both soil and sediment. In the 1999 Risk Assessment (Ensafe, 1999), available surface soil data were screened against residential MSSLs. Maximum detected concentrations in surface soil that exceeded the residential MSSLs were as follows: 0.24 mg/kg of aldrin, 0.078 mg/kg of dieldrin, 340 mg/kg of methoxychlor, 14 mg/kg of toxaphene, and 160 mg/kg of dinoseb.

2.7 Site 8 - Ditch by Wastewater Treatment Area (Area of Concern 3)

Surface soil samples were collected during Phase I FI activities. Metals and dieldrin were detected in surface soil. In the 1999 Risk Assessment (Ensafe, 1999), available surface soil data were screened against residential MSSLs. Maximum detected concentrations of 6.3 mg/kg of arsenic were above residential MSSLs.

2.8 Site 9 - Former Dinoseb Disposal Ponds

During the 1993 field activities for Phase I of the FI, surface soil and subsurface soil samples were collected. Metals, pesticides, SVOCs, and VOCs were detected in soil. In the 1999 Risk

Assessment (Ensafe, 1999), available surface soil data were screened against residential MSSLs, and surface/subsurface soil data were screened against industrial MSSLs. Maximum detected concentrations in surface soil that exceeded the residential MSSLs were as follows: 0.15 mg/kg of heptachlor, 450 mg/kg of 3,4-dichloroaniline, 29,000 mg/kg of dinoseb, 4,000 mg/kg of Propanil, and 3.5 mg/kg of arsenic. Maximum detected concentrations above industrial MSSLs in subsurface soil included: 7.3 mg/kg of arsenic, 29,000 mg/kg of dinoseb, 450 mg/kg of 3,4-dichloroaniline, 4,000 mg/kg of Propanil, and 0.73 mg/kg of 1,2-dichloroethane.

3.0 SWMU and AOC Summary Tables

A total of 80 SWMUs and three AOCs were identified at the CCC facility based on a review of the available file material. Tables 1 and 2 provide a brief description of all SWMUs and AOCs. Not all of the SWMUs and AOCs in the following tables are associated with documented releases. Refer to Section 2.0 of this profile for discussion of known or suspected releases. Figure 3 illustrates the location of these SWMUs and AOCs.

Release potential was evaluated based on the following criteria:

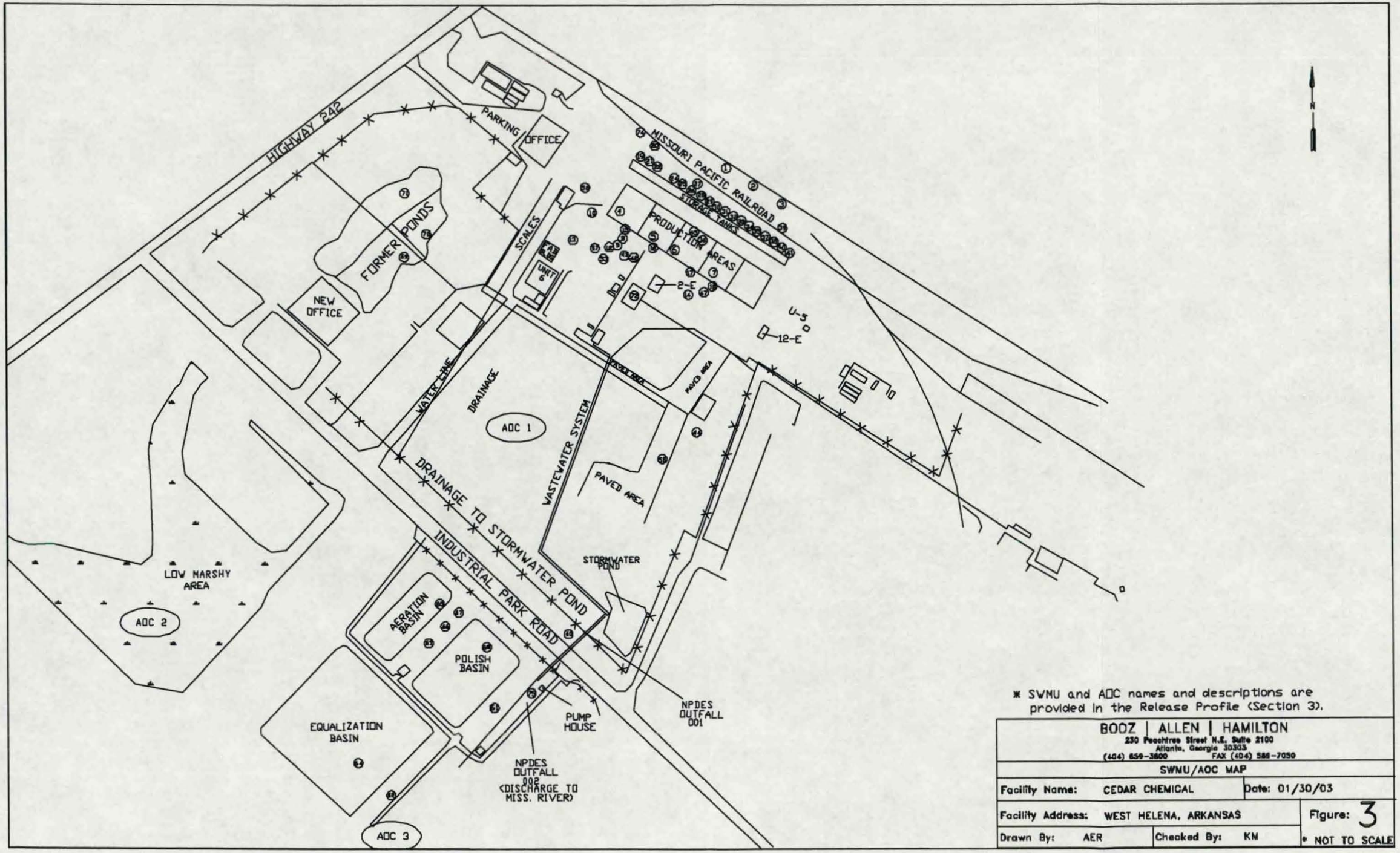
Unknown — Unit was known or suspected to manage hazardous waste; however, no information about releases was identified in the available file material and no sampling data were collected.

Low — Unit was known or suspected to manage hazardous waste, and releases are suspected to have occurred. Alternatively, releases are known to have occurred and sampling data have confirmed that released concentrations are below human health and ecological screening values. This category is also used for units at which a release occurred, but corrective action has removed all constituents to concentrations below human health and ecological screening values. In addition,

SWMUs or AOCs that EPA agreed no further investigation or action was necessary were designed in this category.

Medium — Unit is known to have managed hazardous waste, and releases are known or suspected to have occurred. Sampling has not been conducted to confirm releases of hazardous constituents.

High — Unit was known to manage hazardous waste, and releases are known to have occurred.



* SWMU and AOC names and descriptions are provided in the Release Profile (Section 3).

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SWMU/AOC MAP

Facility Name: CEDAR CHEMICAL		Date: 01/30/03
Facility Address: WEST HELENA, ARKANSAS		Figure: 3
Drawn By: AER	Checked By: KN	* NOT TO SCALE

Table 2[1] SWMU Descriptions						
SWMU	**SWMU Name**	**Type of Unit**	**Period of Operation**	**Wastes Managed**	**Unit Description**	**Release Potential**
8	Boiler Blowdown Area Sump 1	Sump	1970s - 2002	This unit managed boiler blowdown and surface runoff.	This unit was located immediately to the east of the boiler house, north of the Boiler Blowdown Area Sump 2 (SWMU 9). The unit measured two feet long, four feet wide, and four feet deep. The sump was constructed of concrete, and the area adjacent to the sump was paved with concrete. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
9	Boiler Blowdown Area Sump 2	Sump	1970s - 2002	This unit managed boiler blowdown and surface runoff.	This unit was located immediately to the east of the Boiler House, south of the Boiler Blowdown Area Sump 1 (SWMU 8). The unit measured four feet long, six feet wide, and two feet deep. The sump and the surrounding area were constructed of concrete. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
10	Laboratory Sump	Sump	1970s - 2002	The sump managed laboratory and domestic wastes.	This unit was located adjacent to the laboratory building in the northwest corner of the facility. The sump was constructed of concrete with a metal cover. The sump had a capacity of approximately 6,000 gallons. The dimensions of the sump were approximately 12 feet long, six feet wide, and four feet deep. The RFA conducted by EPA recommended no further action for this unit.	Low-NFA
11	Sump Near Main Tank Farm	Sump	1970s - 2002	The sump managed cooling tower blowdown and surface runoff.	This unit was located in the main tank farm of the facility. The sump was constructed of concrete. The dimensions of the sump were approximately three feet long, three feet wide, and three feet deep. The RFA conducted by EPA recommended no further action for this unit.	Low-NFA

Table 2[1] SWMU Descriptions						
SWMU	**SWMU Name**	**Type of Unit**	**Period of Operation**	**Wastes Managed**	**Unit Description**	**Release Potential**
12	Maintenance Shop Drainage System and Sump	Drainage System and Sump	1970s - 2002	The unit managed spills from maintenance shop operations.	The drainage system was located in the maintenance shop and drained to a sump adjacent to the outside of the maintenance building. The drainage system was comprised of a concrete channel that measured approximately 40 feet long, one foot wide, and six inches deep. The sump was approximately five feet long, five feet wide, and three feet deep. The sump is constructed in concrete with a metal grate cover. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
13	Truck Scale Sump	Below-Ground Sump	1970s - 2002	The sump managed occasional spills of various raw materials or chemicals from incoming and outgoing trucks.	This unit was located in the western portion of the facility. The unit was constructed of concrete and measures three feet long, three feet wide, and three feet deep. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
14	Packaging Building Sump	Sump	1970s - 2002	The sump managed spills in the Packaging Building.	This unit was located adjacent to the Packaging Building. The unit has an open top and was constructed of concrete. The dimensions of the sump were three feet long, three feet wide, and two feet deep. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
15, 16, 17	Air Emissions Scrubbers 1, 2, and 3	Air Emissions Scrubbers	1970s - various	The units managed gaseous emissions from tanks of chemicals used in the production processes.	The units were located in the Production Unit 1, 2, and 3. The units were constructed of steel and measured approximately 18 inches by 18 feet. The RFA conducted by EPA recommended NFA for these units.	Low-NFA

Table 2[1] SWMU Descriptions						
SWMU	**SWMU Name**	**Type of Unit**	**Period of Operation**	**Wastes Managed**	**Unit Description**	**Release Potential**
18	Air Emissions Scrubber 4	Air Emission Scrubber	1970s - 2002	This unit managed gaseous emissions from the production of RP-10.	This unit was located in the main tank farm within a curbed concrete area. The dimensions of the unit were 24 inches by 24 feet. The scrubber was constructed of steel. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
19	Sump in Main Tank Farm Diked Area 1 (North)	Sump	1970s - 2002	This unit managed leaks and spills of thionyl chloride.	This unit was located within Diked Area 1, which was part of the facility's main tank farm. The sump was constructed into the concrete floor with an open top. The sump measured approximately two feet long, two feet wide, and two feet deep. The diked area was constructed of concrete and measured approximately 20 feet long and 20 feet wide. A concrete platform with a thionyl chloride tank was situated in the center of the diked area. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
20	Sump in Main Tank Farm Diked Area 1 (South)	Sump	1970s - 2002	This unit managed leaks and spills of Tenneco 500.	This unit was located within Diked Area 1, which was part of the facility's main tank farm. The sump was constructed into the concrete floor with an open top. The sump measured approximately two feet long, two feet wide, and two feet deep. The diked area was constructed of concrete and measured approximately 20 feet long and 20 feet wide. A concrete platform with a Tenneco 500 tank was situated in the center of the diked area. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA

Table 2[1] SWMU Descriptions						
SWMU	**SWMU Name**	**Type of Unit**	**Period of Operation**	**Wastes Managed**	**Unit Description**	**Release Potential**
21	Sump in Main Tank Farm Diked Area 2	Sump	1970s - 2002	This unit managed leaks and spills of methyl alcohol and toluene.	This unit was located within Diked Area 2, which was part of the facility's main tank farm. The sump was constructed into the concrete floor with an open top. The sump measured approximately two feet long, two feet wide, and two feet deep. The diked area was constructed of concrete and measured approximately 40 feet long and 20 feet wide. Concrete platforms supported two tanks that contain methyl alcohol and toluene. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
22	Sump in Main Tank Farm Diked Area 3	Sump	1970s - 2002	This unit managed leaks and spills of propionic acid, propionic anhydride, dichloroaniline, isophorone, and emulsifier.	This unit was located within Diked Area 3, which was part of the facility's main tank farm. The sump was constructed into the concrete floor. The diked area was constructed of concrete and measured approximately 20 feet long and 40 feet wide. Concrete platforms supported eight tanks that contain propionic acid, propionic anhydride, dichloroaniline, isophorone, and emulsifier. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
23	Waste Storage Tank PE-209 in Main Tank Farm Diked Area 4	Tank	1970s - 2002	This unit contained wastewater from Production Unit 1 and 2.	This unit was located in Diked Area 4, which was part of the facility's main tank farm. The waste storage tank had a capacity of 12,000 gallons and measured approximately 10 feet in diameter by 24 feet in length. The unit was constructed of glass and steel. The dimensions of the surrounding diked area were approximately 50 feet long and 30 feet wide. The RFA conducted by EPA recommended no further action for this unit.	Low-NFA

Table 2[1] SWMU Descriptions						
SWMU	**SWMU Name**	**Type of Unit**	**Period of Operation**	**Wastes Managed**	**Unit Description**	**Release Potential**
24	Waste Storage Tank 002 in Main Tank Farm Diked Area 5	Tank	1970s - 2002	This unit contained permethrin and cypermethrin wastewater.	This unit was located in Diked Area 5, which was part of the facility's main tank farm. The waste storage tank had a capacity of 17,000 gallons and measured approximately 15 feet long by 30 feet wide. The surrounding diked area was approximately 30 feet long and 20 feet wide and it was equipped with a sump. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
25	Sump in Main Tank Farm Diked Area 6	Sump	1970s - 2002	This unit managed the leaks and spills from the sodium hypochlorite storage tank located within the diked area.	This unit was located within Diked Area 6, which was part of the facility's main tank farm. The sump was constructed into the concrete floor with an open top. The sump measured two feet long, two feet wide, and two feet deep. The diked area was constructed of concrete and measured 15 feet long by 20 feet wide. A concrete platform supports a sodium hypochlorite storage tank. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
26	Sump in Main Tank Farm Diked Area 7	Sump	1970s - 2002	This unit managed the leaks and spills from the sodium hydroxide and scrubber liquid storage tanks located within the diked area.	This unit was located within Diked Area 7, which was part of the facility's main tank farm. The sump was constructed into the concrete floor with an open top. The sump measured one foot long, one foot wide, and one foot deep. The diked area was constructed of concrete and measured 20 feet long by 20 feet wide. A concrete platform supports sodium hydroxide and scrubber liquid storage tanks. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA

Table 2[1] SWMU Descriptions						
SWMU	**SWMU Name**	**Type of Unit**	**Period of Operation**	**Wastes Managed**	**Unit Description**	**Release Potential**
27	Tank B-109 in Main Tank Farm Diked Area 7	Tank	1970s - 1980s	This unit contained scrubber liquid waste.	This unit was located within Diked Area 7, which was part of the facility's main tank farm. The tank was used to hold scrubber liquid for Air Emissions Scrubber 3 (SWMU 17). The carbon steel tank had the capacity of 6,000 gallons. The dimensions of the tank were approximately 12 feet in diameter by 12 feet high. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
28	Waste Storage Tank B-112 in Main Tank Farm Diked Area 8	Tank	1976 - 1985	This unit contained wastes from Production Area 3.	This unit was located in the main tank farm Diked Area 8. The unit is a carbon steel tank that had the capacity of 20,000 gallons. The dimensions of the unit were approximately 12 feet long by 24 feet wide. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
29	Sump in Main Tank Farm Diked Area 9	Sump	1970s - 1985	This unit managed waste RP-10 waste.	This unit was located within Diked Area 9, which was part of the facility's main tank farm. The sump was constructed into the concrete floor and measured approximately one foot long, one foot wide, and one foot deep. The dimensions of the diked area were approximately 15 feet long by 20 feet wide. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
30	Waste Water Storage Tank B-102 in Main Tank Farm Diked Area	Tank	1970s - 2002	This unit contained methylthiopinacolone oxide wastewater.	This unit was located in the main tank farm Diked Area 10. The unit was a carbon steel tank with the capacity of 20,000 gallons used to store wastewater from Production Unit 3 and 4. The unit measured 12 feet wide by 24 feet high and was mounted on a raised concrete platform. The diked area measured approximately 20 feet long by 20 feet wide. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA

Table 2[1] SWMU Descriptions						
SWMU	**SWMU Name**	**Type of Unit**	**Period of Operation**	**Wastes Managed**	**Unit Description**	**Release Potential**
31	Sump in Main Tank Farm Diked Area 11	Sump	1970s - 2002	This unit managed leaks and spills from the caustic storage tank located within the diked area.	This unit was located within Diked Area 11, which was part of the facility's main tank farm. The sump was constructed into the concrete floor and measured approximately one foot long, one foot wide, and one foot deep. The dimensions of the diked area were approximately 15 feet long by 20 feet wide. A concrete platform within the diked area supports a caustic storage tank. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
32	Sump in Main Tank Farm Diked Area 12	Sump	1970s - Unknown	This unit managed leaks and spills of acetic anhydride.	This unit was located within Diked Area 11, which is part of the facility's main tank farm. The sump was constructed into the concrete floor within the diked area and measured approximately one foot long, one foot wide, and one foot deep. The dimensions of the diked area were approximately 15 feet long by 20 feet wide. A concrete platform within the diked area supported a acetic anhydride storage tank. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
33	Tank 204 in Main Tank Farm Diked Area 13	Tank	1970s - 2002	This unit contained spent sulfuric acid.	This unit was located within Diked Area 13, which was part of the facility's main tank farm. The unit was a stainless steel tank with a capacity of 3,000 gallons. The tank vented to Air Emissions Scrubber 4 (SWMU 18). The dimensions of the diked area were approximately 20 feet long by 20 feet wide. A concrete platform within the diked area supports the tank. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA

Table 2[1] SWMU Descriptions						
SWMU	**SWMU Name**	**Type of Unit**	**Period of Operation**	**Wastes Managed**	**Unit Description**	**Release Potential**
34	Tank 201 in Main Tank Farm Diked Area 14	Tank	1970s - 2002	This unit contained scrubber liquid waste.	This unit was located within Diked Area 14, which was part of the facility's main tank farm. The unit was a carbon steel tank that had a capacity of 10,000 gallons. The dimensions of the tank were 12 feet in diameter by 12 feet high. The diked area measured approximately 20 feet long by 20 feet wide. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
35	Tank N205 in Main Tank Farm Diked Area 15	Tank	1970s - 2002	The unit contained spent acid generated during the RP-10 production.	This unit was located within Diked Area 15, which was part of the facility's main tank farm. The unit was a stainless steel tank with a capacity of 17,000 gallons. The dimensions of the unit were approximately 14 feet by 16 feet. The tank contained spent acid which was recycled back into the production processes. The tank vented to Air Emissions Scrubber 4 (SWMU 18). The diked area measures approximately 20 feet long by 20 feet wide. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
36	Tank 206 in Production Unit 4	Tank	1970s - 2002	This unit contained neutralized acid wastes.	This unit was located within Production Area 4. The unit was a glass-lined steel wastewater holding tank with a capacity of 5,000 gallons. The dimensions of the unit were approximately eight feet by 11 feet. The tank contained neutralized acid wastes from Production Unit 3 and 4. The tank vents to Air Emissions Scrubber 4 (SWMU 18). The unit was located within a production area that is curbed and also contained a Drainage System and Sump (SWMU 6). The RFA conducted by EPA recommended NFA for this unit.	Low-NFA

Table 2[1] SWMU Descriptions						
SWMU	**SWMU Name**	**Type of Unit**	**Period of Operation**	**Wastes Managed**	**Unit Description**	**Release Potential**
37	Sump in Main Tank Farm Diked Area 16	Sump	1970s - 2002	This unit managed leaks and spills from the wash/hold tank.	This unit was located within Diked Area 16, which was part of the facility's main tank farm. The sump was constructed into the concrete floor. The sump measured approximately two feet long, two feet wide, and two feet deep. The diked area had the approximate dimensions of 20 feet long by 20 feet wide. A concrete platform located in the diked area supported a wash/hold tank. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
38	Sump in Main Tank Farm Diked Area 17	Sump	1970s - 2002	This unit managed leaks and spills from Tanks 105 and 106.	This unit was located within Diked Area 17, which was part of the facility's main tank farm. The sump was constructed into the concrete floor and measured approximately one foot long, one foot wide, and one foot deep. The diked area had the approximate dimensions of 30 feet long by 30 feet wide. A concrete platform in the diked area supported Tanks 105 (SWMU 39) and 106. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
39	Tank M105 in Main Tank Farm Diked Area 17	Tank	1975 - 1986	The unit contained spent sulfuric acid/ wastewaters.	This unit was located within Diked Area 17, which was part of the facility's main tank farm. The unit was a steel tank supported by a concrete platform within the diked area. Tank M105 contained spent sulfuric acid from 1975 to 1980 and dodocene from 1980 to January 1986. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA

Table 2[1]
SWMU Descriptions

SWMU	SWMU Name	Type of Unit	Period of Operation	Wastes Managed	Unit Description	Release Potential
40	Sump in Main Tank Farm Diked Area 18	Sump	1970s - 1986	The unit managed leaks and spills of kerosene and dodocene.	This unit was located within Diked Area 18, which was part of the facility's main tank farm. The sump was constructed into the concrete floor and measured approximately one foot long, one foot wide, and one foot deep. The diked area had the approximate dimensions of 30 feet long by 20 feet wide. A concrete platform in the diked area supported Tanks 108 and 110. Tank 108 contained kerosene and Tank 110 contained dodocene. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
41	Sump in Main Tank Farm Diked Area 19	Sump	1970s - 1986	This unit managed leaks and spills of kerosene.	This unit was located within Diked Area 19, which was part of the facility's main tank farm. The sump was constructed into the concrete floor and measured approximately one foot long, one foot wide, and one foot deep. The diked area had the approximate dimensions of 10 feet long by 15 feet wide. A concrete platform in the diked area supported Tank 109, which previously contained kerosene. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
42	Sump in Second Tank Farm Diked Area 1	Sump	1970s - 2002	This unit managed leaks and spills from Propanil Blend Tanks.	This unit was located within the Second Tank Farm in Diked Area 1, which was south of the production areas. The sump was constructed into the concrete floor and measured approximately three feet long, three feet wide, and three feet deep. The diked area had the approximate dimensions of 25 feet long, 45 feet wide, and three and one half feet high. Two Propanil Blend Tanks (Tanks PR-202 and PR-203) were located within the diked area. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA

Table 2[1]
SWMU Descriptions

SWMU	SWMU Name	Type of Unit	Period of Operation	Wastes Managed	Unit Description	Release Potential
43	Wastewater Tank 014 in Second Tank Farm Diked Area 3	Tank	1970s - 2002	The unit contained wastes from production areas that manufactured Schenectady Chemicals, Inc. (SCI) products.	This unit was located within the Second Tank Farm, which was south of the production areas. The unit was a horizontally mounted, cylindrical steel tank that was approximately 30 feet long by 10 feet in diameter. The unit was used to store wastewater generated during the manufacture of SCI products. A concrete floor and diked area comprised the secondary containment for the unit. The diked area measured approximately 60 feet long, 40 feet wide, and three feet high. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
44	Hazardous Waste Storage Area	Storage Area	July 1984 - 2002	This unit accumulated hazardous waste in 55-gallon drums.	This unit was located to the south of the warehouse at the facility, and it was used to accumulate hazardous waste contained in 55-gallon drums. The unit was constructed of concrete and it measures approximately 12 feet long and 40 feet wide. The concrete floor was sloped to the middle of the unit to a drainage channel leading to a sump at the north end of the unit. The sump had a capacity of 500 gallons, and was covered by a grate. The concrete portion of the unit had six inch curbing on three sides and a corrugated metal roof covered the unit. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
45	Non-hazardous Waste Storage Area	Storage Area	1981 - 2002	This unit stored non-hazardous waste in 55-gallon drums.	This unit was located on the north side of the nitrogen storage tank and stored non-hazardous waste in 55-gallon drums. The unit is a flat, uncovered concrete surface that measures approximately 40 feet long by 40 feet wide. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA

Table 2[1] SWMU Descriptions						
SWMU	**SWMU Name**	**Type of Unit**	**Period of Operation**	**Wastes Managed**	**Unit Description**	**Release Potential**
46	Drum Storage Area	Storage Area	Unknown - 2002	This unit stored empty drums.	This unit was located to the east of the loading dock, and it is used to store drums at the facility. The unit is comprised of asphalt and concrete and it is sloped to drain to the facility's Stormwater Drainage System (SWMU 59). The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
47	Drum Crushing Area	Concrete Area	1970s - 2002	This unit managed potentially contaminated rinse water from drum crushing processes.	This unit was located to the west of the packaging building at the facility. The unit was comprised of concrete and contained a facility-made hydraulic press used to crush empty drums. Concrete secondary containment was available on two sides of the unit. The RFA conducted by EPA noted that the drums were reportedly rinsed prior to crushing. Runoff from the unit drained to the facility's Stormwater Drainage System (SWMU 59). Due to the condition of the unit and the nature of its function, release of hazardous constituents to media was determined to be likely. The RFA Report recommended an RFI for this unit.	Medium
48	Waste Drum Staging Area	Staging Area	1970s - 2002	This unit managed empty and rinsed drums.	This unit was located near the eastern perimeter of the facility and contained empty, rinsed drums awaiting shipment off site. The unit was an unlined and measured approximately 20 feet long by 20 feet wide. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA

Table 2[1] SWMU Descriptions						
SWMU	**SWMU Name**	**Type of Unit**	**Period of Operation**	**Wastes Managed**	**Unit Description**	**Release Potential**
49	Scrap Drum Storage Wagons	Wagons	1970s - 2002	These units managed scrap drum debris.	The wagons were located at several areas of the facility and contained clean, crushed scrap drums awaiting shipment off site. The wagons were comprised of cotton and they were approximately 10 feet by 30 feet with wood planking and chain link sides. The chain link sides of the units are approximately eight feet high. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
50	Waste Drum Staging Area in Main Tank Farm Area	Staging Area	Unknown - 2002	This unit staged empty drums.	This unit was located within the main tank farm Area and contained numerous empty drums awaiting shipment off site or reuse. The drums previously contained raw chemicals stored on skids in between two diked areas in the main tank farm. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
51	Waste Oil Drum	Drum	Unknown - 2002	This unit accumulated waste oil.	This unit was located adjacent to the southeast corner of the Maintenance Shop. The unit was a 55-gallon drum containing waste oil received from maintenance operations. The unit was located on a concrete pad that was sloped to the facility's Stormwater Drainage System (SWMU 59). The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
52	Drums	Drums	Unknown	Unknown	These units were two 55-gallon drums located in a field northwest of the Stormwater Sump (SWMU 60) within 50 feet of and sloped to the facility's Stormwater Drainage System (SWMU 59). The RFA conducted by EPA recommended NFA for this unit.	Low-NFA

Table 2[1] SWMU Descriptions						
SWMU	**SWMU Name**	**Type of Unit**	**Period of Operation**	**Wastes Managed**	**Unit Description**	**Release Potential**
53	Solvent Cleaner Tank	Tank	Unknown - 2002	This unit contained solvent waste.	This unit was located on a concrete floor along the east wall of an enclosed maintenance shop. The unit was a solvent cleaner tank used to clean miscellaneous parts. The dimensions of the unit were two feet long, three feet wide, and two and one-half feet deep. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
54	Miscellaneous Drum Storage	Storage Area	Unknown	Unknown	This unit was comprised of miscellaneous marked and unmarked drums located throughout the facility. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
55	Dumpsters	Dumpsters	1970s - 2002	These units managed non-hazardous waste material, consisting primarily of paper, scrap wood, and metal.	These units were located throughout the facility and were used to dispose of inert materials generated by activities at the facility. Waste material at these units consist of non-hazardous waste, including paper, scrap wood, and metal. The capacity of the dumpsters ranged from approximately two to six cubic yards. The open-top dumpsters were constructed of steel. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
56	Laboratory Waste Rack Area	Racks	1982 - 2002	This unit managed products, raw chemicals, and waste streams generated by the production process at the facility.	This unit was located outside and adjacent to the southern end of the laboratory. The racks held containers ranging from five gallon plastic bottles to 55-gallon drums. The unit received wastes generated by laboratory activities. Most of the racks were located on a concrete pad measuring approximately 10 feet long by 15 feet wide. No secondary containment was present at this unit. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA

Table 2[1] SWMU Descriptions						
SWMU	**SWMU Name**	**Type of Unit**	**Period of Operation**	**Wastes Managed**	**Unit Description**	**Release Potential**
57	Warehouse Drum Storage Area	Storage Area	1970s - 2002	This unit managed waste including off-specification products and raw materials.	This unit was a section within the warehouse where 55-gallon drums containing wastes such as off-specification products and raw materials awaited transfer to the Loading/Unloading Dock Area (SWMU 58) for off-site shipment. The unit had a concrete floor and corrugated metal walls and roof. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
58	Loading/Unloading Dock Area	Dock	1970s - 2002	This unit managed waste including off-specification products, raw materials, and miscellaneous wastes.	This unit was a raised concrete platform that was located adjacent to the Packaging Building. The unit extended out from the Packaging Building to form a raised surface measuring approximately 50 feet long, 50 feet wide, and four feet high. Wastes contained in 55-gallon drums from the Warehouse Drum Storage Area (SWMU 57), including off-specification products and raw materials, were transferred to this unit prior to off-site shipment. The concrete floor of the unit was sloped to enable spills to channel to the facility's Stormwater Drainage System (SWMU 59). The RFA conducted by EPA recommended NFA for this unit.	Low-NFA

Table 2[1] SWMU Descriptions						
SWMU	**SWMU Name**	**Type of Unit**	**Period of Operation**	**Wastes Managed**	**Unit Description**	**Release Potential**
59	Stormwater Drainage System	Stormwater Drainage System	1970s - 2002	This unit managed potentially contaminated storm water runoff.	This unit was a system of four storm water ditches and corrugated metal pipe that drained the entire facility. The ditches flow through the interior of the property to the southwest, and they drain into a larger storm water ditch adjacent to Industrial Park Road. This larger storm water ditch then flowed south into the Stormwater Sump (SWMU 60). The ditches were unlined and range in width from three feet to six feet, and in depth from two feet to five feet. One of the unlined ditches is within 10 feet of the Yellow Stain Areas (AOC 1). The unit was designed to drain the first 100,000 gallons from an excessive rainfall event to the Stormwater Sump. The remainder was then diverted through a manually operated gate to NPDES-permitted outfall #001, which drained off-site to the Industrial Park Ditch. The RFA Report recommended an RFI for this unit and this SWMU has been incorporated into Site 3.	High
60	Stormwater Sump	Sump	1977 - 2002	This unit managed potentially contaminated storm water.	This unit was a component of the wastewater treatment system and was located on the north side of Industrial Park Road. The unit was an unlined earthen basin with a capacity of 200,000 gallons, measuring approximately 50 feet long by 12 feet deep. The wastes this unit may have received include storm water runoff, boiler blowdown, noncontact cooling water, raw materials, and product. Under normal operating conditions, storm water stored in the unit from the sump was pumped to the API Separator (SWMU 62). The RFA conducted by EPA noted the unit exhibited no release controls and has a high release potential to all media; thus, an RFI was recommended for this unit. This SWMU has been incorporated into Site 3.	Medium

Table 2[1] SWMU Descriptions						
SWMU	**SWMU Name**	**Type of Unit**	**Period of Operation**	**Wastes Managed**	**Unit Description**	**Release Potential**
61	Wastewater Tank 1 Wastewater Treatment System	Tank	1977 - 2002	This unit contained separated oils and solvents.	This unit was located on the south side of Industrial Park Road. The unit was constructed of carbon steel and had a capacity of approximately 10,000 gallons. The unit was mounted horizontally on a concrete pad that measures approximately 20 feet long by 30 feet wide. A two-foot high, six-inch thick concrete wall around the perimeter of the concrete base provided secondary containment. The unit received separated heavy and light oils directly from the API Separator (SWMU 62). Reusable oils were pumped back to the production areas for reuse and non-reusable wastes are shipped off site for disposal. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
62	API Separator	API Separator	1977 - 2002	This unit managed storm water runoff and wastewater.	This unit was located on the south side of Industrial Park Road. The unit was a component of the wastewater treatment system and was used to separate solvents and non-soluble organic liquids. This unit was epoxy-lined and was constructed of carbon steel. The API separator measured approximately eight feet long, eight feet wide, and 12 feet high. This unit was designed to receive wastes directly from each of the production area drainage systems and sumps (SWMUs 4, 5, 6, and 7), as well as from the Stormwater Sump (SWMU 60). Wastewater from this unit was channeled to the Flow Equalization Basin (SWMU 64), and separated oils were directed to Wastewater Tank 1 (SWMU 61). Wastes managed by this unit included storm water runoff and waste streams generated from Production Units 1 through 6. The RFA conducted by EPA recommended NFA for this unit.	Low-NFA

Table 2[1] SWMU Descriptions						
SWMU	**SWMU Name**	**Type of Unit**	**Period of Operation**	**Wastes Managed**	**Unit Description**	**Release Potential**
63	Wastewater Tank 2 Wastewater Treatment System	Tank	1977 - 2002	This unit contained storm water runoff and wastewater.	This unit was located on the south side of Industrial Park Road on an earthen dike that separates and was sloped to the Aeration Basin (SWMU 65) and the Polish Pond (SWMU 68). The unit was a steel tank with a capacity of 13,000 gallons and measures approximately 12 feet in diameter by 15 feet high. The unit was a component of the wastewater treatment plant and received waste directly from the Production Unit 1 through 6. Effluent from the tank was pumped to the Aeration Basin (SWMU 65), bypassing the Flow Equalization Basin (SWMU 64). The unit was situated on a concrete pad, was surrounded by bare ground, and was equipped with a sampling valve. The RFA conducted by EPA noted soil stains from leaks released by the sampling valve; thus, an RFI was recommended for this unit. This SWMU has been incorporated into Site 1.	High

Table 2[1] SWMU Descriptions						
SWMU	**SWMU Name**	**Type of Unit**	**Period of Operation**	**Wastes Managed**	**Unit Description**	**Release Potential**
64	Flow Equalization Basin	Basin	1977 - 2002	This unit managed effluent from the API Separator.	This unit was located on the south side of Industrial Park Road. The unit was a component of the wastewater treatment system and was used to equalize flows and concentrations prior to aerated biological treatment. The unit receives wastes from the API Separator (SWMU 62). The unit was an 8,000,000-gallon basin that measures approximately 295 feet long, 353 feet wide, and 15 feet deep. The unit is lined with bentonite clay. The maximum capacity of the unit was 7,300,000 gallons, but the unit is operated at approximately 2,000,000 gallons. The unit has a 25 horse power Ashbrook aerator near the entrance of the influent pipe. The effluent was pumped from the Flow Equalization Basin to the Aeration Basin (SWMU 65), with a return line from the pump back to the entrance of the Flow Equalization Basin. At the time of the RFA, a sampling program was underway under a Consent Order Agreement. It was recommended that an RFI be performed for this unit. This SWMU has been incorporated into Site 1.	Medium

Table 2[1] SWMU Descriptions						
SWMU	**SWMU Name**	**Type of Unit**	**Period of Operation**	**Wastes Managed**	**Unit Description**	**Release Potential**
65	Aeration Basin	Pond	1977 - 2002	This unit managed effluent from the Flow Equalization Basin or Wastewater Tank 2.	This unit was located on the south side of Industrial Park Road. The unit was a 600,000-gallon pond lined with bentonite clay, and measuring 127 feet long, 262 feet wide, and 15 feet deep. The unit was a component of the wastewater treatment system that receives wastes from the Flow Equalization Basin (SWMU 64) and from Wastewater Tank 2 (SWMU 63). The return line to the Flow Equalization Basin has a static aerator for mixing procedures. Following treatment in the unit, the wastewater is pumped to two rectangular Clarifiers (SWMUs 66 and 67). At the time of the RFA, a sampling program was underway under a Consent Order Agreement. It was recommended that an RFI be performed for this unit. This SWMU has been incorporated into Site 1.	Medium
66	Clarifier 1	Clarifier	1977 - 2002	This unit managed waste sludge from the Aeration Basin.	This unit was located on the south side of Industrial Park Road between the Polish Pond (SWMU 68) and the Aeration Basin (SWMU 65). This unit was a component of the wastewater treatment system used to facilitate sludge return. This unit was one of two side-by-side clarifiers at the facility. The unit was constructed of concrete eight inches thick and measures 12 feet long, 34 feet wide, and eight feet deep. This unit received waste from the Aeration Basin (SWMU 65). Effluent from the unit was pumped to Polish Pond (SWMU 68). The RFA conducted by EPA recommended NFA for this unit.	Low-NFA

Table 2[1] SWMU Descriptions						
SWMU	**SWMU Name**	**Type of Unit**	**Period of Operation**	**Wastes Managed**	**Unit Description**	**Release Potential**
67	Clarifier 2	Clarifier	1977 - 2002	This unit managed waste sludge from the Aeration Basin.	This unit was located on the south side of Industrial Park Road between the Polish Pond (SWMU 68) and the Aeration Basin (SWMU 65). This unit was a chain and flight clarifier, a component of the wastewater treatment system, used to facilitate sludge return. This unit was one of two side-by-side clarifiers at the facility. The unit was constructed of concrete eight inches thick and measures 12 feet long, 34 feet wide, and eight feet deep. This unit received waste from the Aeration Basin (SWMU 65). Effluent from the unit was pumped to Polish Pond (SWMU 68). The RFA conducted by EPA recommended NFA for this unit.	Low-NFA
68	Polish Pond	Pond	1977 - 2002	This unit managed effluent from the Clarifiers.	This unit was located on the south side of Industrial Park Road. The unit was a component of the wastewater treatment plant and was the final hold area before discharge to the Mississippi River. The unit had a capacity of 4,000,000 gallons and was lined with bentonite clay. The dimensions of the unit were 206 feet long, 262 feet wide, and 15 feet deep. The unit received effluent wastes from the clarifiers (SWMUs 66 and 67). The effluent from the unit was pumped 4.5 miles through an eight-inch, epoxy-lined pipe to NPDES-permitted outfall #002 (SWMU 75) to the Mississippi River. At the time of the RFA, a sampling program was underway under a Consent Order Agreement. It was recommended that an RFI be performed for this unit. This SWMU has been incorporated into Site 1.	Medium

Table 2[1]
SWMU Descriptions

SWMU	SWMU Name	Type of Unit	Period of Operation	Wastes Managed	Unit Description	Release Potential
69, 70, 71	Inactive Pond 1, 2, 3	Pond	1970s - 1978	These units managed a propionic acid waste, a calcium chloride brine, a sulfuric acid waste, and other unknown wastes.	These units were located in the southwest portion of the facility and consisted of surface impoundments that were constructed of earthen fill. The dimensions of the units were approximately 120 feet long by 150 feet wide. The units were used to dispose of wastes from the on-site and off-site production processes prior to the implementation of the wastewater treatment system. Wastes contained in the unit included propionic acid waste, a calcium chloride brine, and a sulfuric acid waste. Wash waters containing unknown wastes produced by the Helena Chemical Company were also directed to this unit; the disposal of such wastes ended in 1976. In 1978, the pond effluent was shipped off site for disposal. The ponds were then filled with dirt, but the pond sediments were not analyzed. The RFA recommended an RFI be performed at this unit to determine the extent of vertical and horizontal contamination. This SWMU has been incorporated into Site 2.	High
72	Drum Vault	Vault	1970s	This unit managed solidified herbicide wastes.	This unit was located underneath the warehouse at the facility. The top of the unit is the concrete floor of the warehouse encasing the drums; the sidewalls are concrete. The RFA conducted by EPA reported the unit contained approximately 250 drums of solidified herbicide wastes. In the late 1970s, the vault was filled with sand and gravel or cement. The condition of this unit could not be determined during the RFA; an RFI was recommended for this unit due to the burial of hazardous wastes and their potential release at this unit. This SWMU has been incorporated into Site 5.	High

Table 2[1] SWMU Descriptions						
SWMU	**SWMU Name**	**Type of Unit**	**Period of Operation**	**Wastes Managed**	**Unit Description**	**Release Potential**
73	Buried Drums	Drums	1970s	Unknown	This unit was comprised of drums containing unknown, potentially hazardous materials that have been buried on-site. The RFA conducted by EPA recommended an RFI be performed for this unit, as hazardous constituents were potentially being released. In 1996, an RFI was conducted by the facility under a CAO. The RFI reported that with the issuance of the CAO, information was obtained regarding the use of the facility prior to Cedar Chemical Corporation's operations. A geophysical survey was conducted and subsurface anomalies were identified in the areas where drums were suspected to have been buried. The facility performed immediate removal actions of the buried drums.	Medium
74	Loading/Unloading Area (Railroad Spur)	Railroad Spur	1970s -2002	This unit managed incidental releases or spills of raw materials, product, and waste by-products.	This unit was located near the northern perimeter of the facility along the Main tank farm and between the production areas and railroad spur. The unit was an unlined, crushed stone surface that measures approximately 20 feet long by 300 feet wide. The unit received wastes from the unloading of raw materials and loading of product and waste by-products. This unit drained to the facility's Stormwater Drainage System. The RFA conducted by EPA observed visible evidence of staining along the entire length of the unit and recommended an RFI be performed at this unit to determine the extent of vertical and horizontal contamination. This SWMU has been incorporated into Site 4.	High

Table 2[1] SWMU Descriptions						
SWMU	**SWMU Name**	**Type of Unit**	**Period of Operation**	**Wastes Managed**	**Unit Description**	**Release Potential**
75	NPDES Outfall #002	Outfall	Unknown - 2002	This unit was the point of discharge for water treated at the wastewater treatment system.	This unit was identified in the FI Preliminary Report as a SWMU. This unit consisted of four and a half miles of piping that carried treated, non-hazardous effluent from the wastewater treatment system to the Mississippi River. The effluent was monitored according to the requirements set forth in NPDES Permit AR0036412. The FI Preliminary Report indicated that five leaks had been reported in the past. However, this unit has not been included in any subsequent investigation.	Unknown
76	Production Unit Wastewater Piping	Piping	Unknown - 2002	This unit carried waste from production units to the wastewater treatment system.	This unit was identified in the FI Preliminary Report as a SWMU. This unit is comprised of both underground and above ground piping that carried non-hazardous wastewater from the various production units to the wastewater treatment system. Leaks in piping have reportedly occurred at CCC site. However, this unit has not been included in any subsequent investigation.	Unknown
77	Production Unit Sumps	Sumps	Unknown - 2002	This unit managed releases from various production units.	This unit was identified in the FI Preliminary Report as a SWMU. Limited information was available regarding which sumps were included in this SWMU. However, this unit has not been included in any subsequent investigation.	Unknown
78	Abandoned Wastewater Piping	Piping	Unknown	This unit transported wastewater from production units to wastewater treatment system.	This unit was identified in the FI Preliminary Report as a SWMU. This unit was a transit pipe that carried process wastewater from Production Unit 4 and 5 to the wastewater treatment system. Due to a leak in the piping near a storm water sump, the piping was abandoned and later removed in September 1991. However, this unit has not been included in any subsequent investigation.	Unknown

Table 2[1] SWMU Descriptions						
SWMU	**SWMU Name**	**Type of Unit**	**Period of Operation**	**Wastes Managed**	**Unit Description**	**Release Potential**
79, 80	Air Emissions Scrubber 5 and 6	Air Emissions Scrubbers	Unknown	Unknown	These units were identified in the FI Preliminary Report. Limited information about these units was provided in the available file material. However, these units have not been included in any subsequent investigation.	Unknown

[1] USEPA. RCRA Facility Assessment. 1988.

Table 3 AOC Descriptions						
AOC	**AOC Name**	**Source of Release**	**Date of Release**	**Hazardous Constituents**	**AOC Description**	**Potential for Further Release**
1	Yellow Stain Areas	Potential dumping on site	No documented release(s)	Dinoseb	Areas of the facility's ground surface were covered with a yellow stain. One stained area was located to the north and east of the warehouse. The RFA conducted by EPA observed visible signs of soil contamination and recommended an RFI be performed for this AOC to determine the nature and extent of the contamination. This AOC has been incorporated into Site 6. Subsequent investigation of this AOC has been included in Site 6 investigations. Refer to Section IV for additional information.	Medium
2	Adjacent Wetland	Groundwater to surface water discharge	No documented release(s)	Unknown	This area is topographically low and adjacent to the wastewater treatment ponds. CCC maintains that no contaminants have impact the wetland, although no sampling has been conducted to confirm this.	Unknown
3	Ditch by Wastewater Treatment Area 2	Overflows	Not available	Metals and Pesticides	This site is a ditch on the south side of the biological treatment ponds and discharges storm water from NPDES Outfall #002 via the treatment ponds. The API Separator (SWMU 62) previously overflowed, and wastewater directed to the treatment ponds was released into the Industrial Park Ditch. To prevent this from occurring, the separator and pad were cleaned, and a gutter was installed in February of 1992, which was designed to divert all overflow into the equalization pond. The contaminated soil in the ditch was also removed, placed in drums, and disposed of off site. This AOC has been incorporated into Site 8.	Medium

LAND USE AND EXPOSURE PROFILE

V. LAND USE AND EXPOSURE PROFILE

1.0 Surrounding Land Use

CCC is an inactive chemical manufacturing facility in Phillips County, Arkansas, just south of West Helena, Arkansas (ADEQ, 2002). The site is approximately 48 acres and is situated along State Highway 242, one mile southwest of the intersection of U.S. Highway 49 and Highway 242. The 1996 FI Report indicated that the entire CCC facility is fenced with controlled access.

According to the RFA report, 80 to 90 people are required to fully operate the facility and the plant was operational 24 hours per day, seven days a week (USEPA, 1988). The facility investigation preliminary report prepared in 1992, indicated that approximately 125 people were employed at the facility at the time (Environmental and Safety Designs, 1992). However, CCC is currently going through bankruptcy and manufacturing operations were shut down on March 8, 2002. As of June 2002, only 21 personnel were working at the facility on 10 hour work days, Monday through Thursday (ADEQ, 2002).

The CCC site is located in the Helena-West Helena Industrial Park. The CCC site is bounded by Arkansas Highway 242 to the northwest, a Union-Pacific railway to the northeast, and other industrial park properties to the southeast and southwest. The land across Highway 242 is agricultural. Residential areas are identified within one-half mile southwest and northeast of the site. Nineteen domestic wells and 13 agricultural wells were within a one-mile radius of the site during FI. None of the domestic wells identified in a door-to door survey conducted in 1995 were being used as a source of drinking water as all the residences were connected to city water (Environmental and Safety Designs, 1996). However, the survey indicated that some of the wells are operational and did not address whether groundwater was still being utilized for other potable uses (e.g., irrigating lawns or washing cars). Groundwater from the agricultural wells is used for irrigation. Locations of the residential and irrigation wells were provided in Figure 2-4 of the Facility Investigation Report (Environmental and Safety Designs, 1996).

Surface water bodies on the CCC site or in the vicinity of the CCC site include a wetland, Beaver Bayou, tributaries to Big Creek (which eventually discharges to the White River), and the Mississippi River. The wetland is adjacent to the wastewater treatment system. Beaver Bayou is located near the industrial park ditches. The Mississippi River is located approximately two miles south and Big Creek is located approximately 15 miles southeast of the CCC facility.

2.0 Potentially Exposed Human Receptors

Human receptor populations that may potentially be exposed to contaminated media as a result of releases at the CCC site include an on-site worker population, a construction worker population, an off-site worker population, off-site resident population, an off-site agricultural worker, and a trespasser population. Because access to the facility is restricted by fencing, trespassers are not currently considered a potentially exposed receptor population. However, in the event that the fence is removed from the site at some point in the future, future trespassers are considered to be a potentially exposed receptor population. Future on-site residents were not considered a potentially exposed receptor population because the CCC facility has not been decommissioned (although it is currently inactive), the site does not currently include large tracts of land conducive to residential redevelopment, and it is located in an industrial park.

3.0 Complete Routes of Exposure

On-site contamination includes groundwater, surface soil, subsurface soil, and sediment. Current on-site workers and future site trespassers may be exposed to contaminated surface soil or sediment, but are not expected to come in direct contact with contaminated subsurface soil or groundwater. In the event that an industrial use well is installed at the CCC site, future on-site workers are conservatively assumed to potentially come in direct contact with contaminated groundwater.

Available information indicates that institutional controls (i.e., deed notices) that restrict intrusive activities at the site have not been implemented to date. Therefore, future on-site construction workers may come in direct contact with contaminated surface soil, subsurface soil, and sediment. Since the depth to perched groundwater is approximately ten feet bgs, future construction worker receptors could also potentially come in direct contact with contaminated groundwater.

Current off-site agricultural workers and off-site residents may come in direct contact with contaminated groundwater during irrigation activities or during other potable uses (e.g., washing equipment or vehicles). Available information also indicates that groundwater use in the area has not been restricted and the alluvial groundwater may be used as a potential drinking water source in the future. Thus, future off-site residents may potentially use domestic wells as a primary drinking water source and could be exposed to contaminated groundwater.

The potentially exposed human receptors, described in Section 2.0, and complete routes of exposure are summarized in Figure 4.

4.0 Ecological Exposures

Several potential ecological exposure pathways are associated with terrestrial and aquatic organisms. Although limited data have been collected for reviewing these exposure pathways, there is a possibility that one or several of these exposure pathways are complete. Ecological exposure pathways identified in the 1999 Risk Assessment, previously conducted at the CCC site, addressed aquatic receptors (tadpoles) that may be exposed to contaminants (metals and pesticides) in Area I (ditches at the wastewater treatment) and the potential exposure to terrestrial receptors (avian) that may consume tadpoles with elevated levels of contaminants. However, the 1999 Risk Assessment did not quantitatively evaluate ecological risk. Rather CCC stated that since the ditches were an integral component of the wastewater treatment system that any aquatic receptors were opportunistic and that the ditches did not provide a suitable sustained habitat.

Another ecological area of concern that was identified in the 1999 Risk Assessment is Area II, which is a wetland. CCC maintains that the wetland has not been impacted by contamination from the CCC site. However, sampling has not been conducted to confirm that sediment and/or surface water at the wetland has not been impacted. If additional data become available that indicates that the wetland has been impacted, potential ecological exposures should be re-evaluated.

Figure 4[1,2]
Conceptual Site Model for Cedar Chemical Corporation

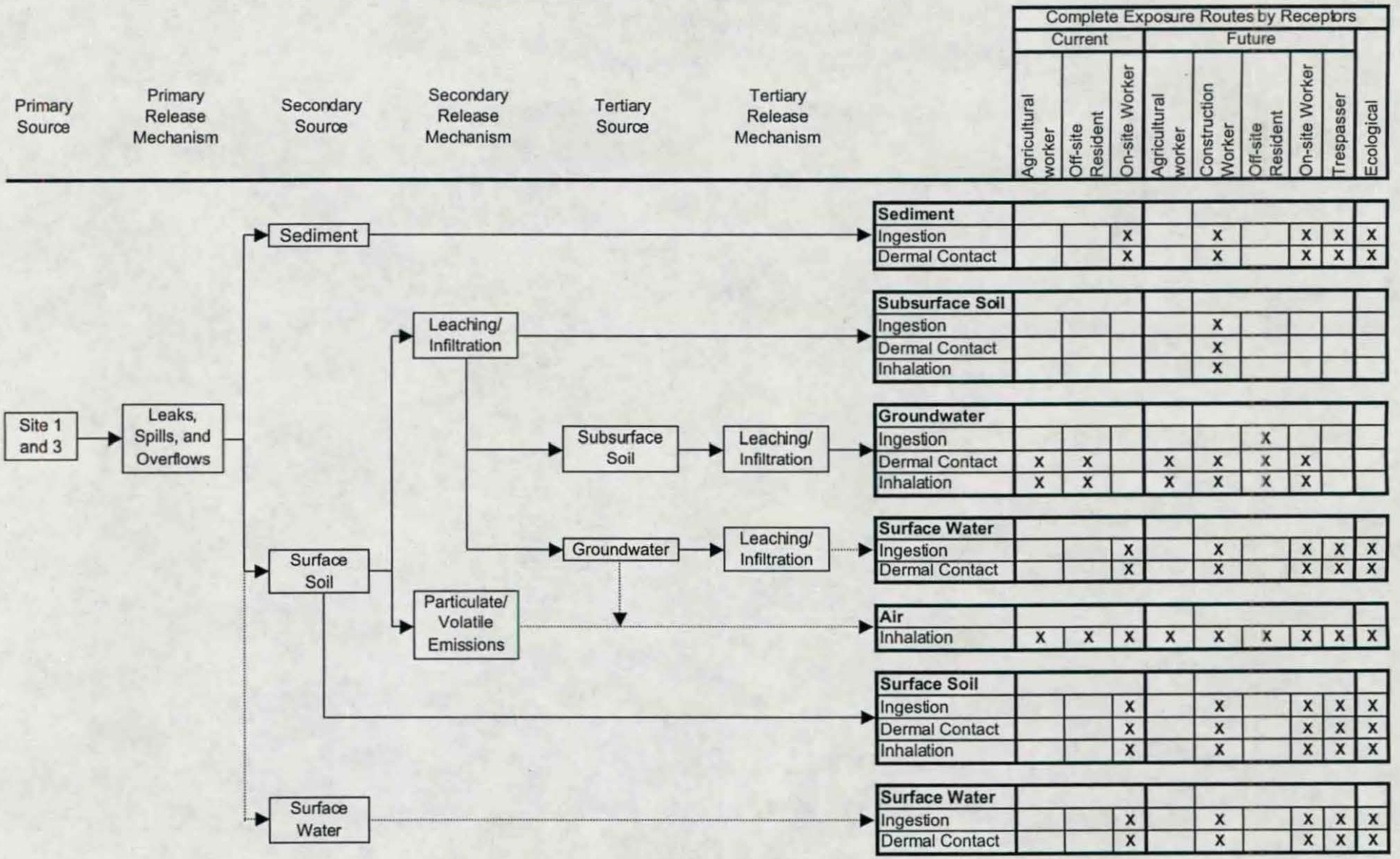
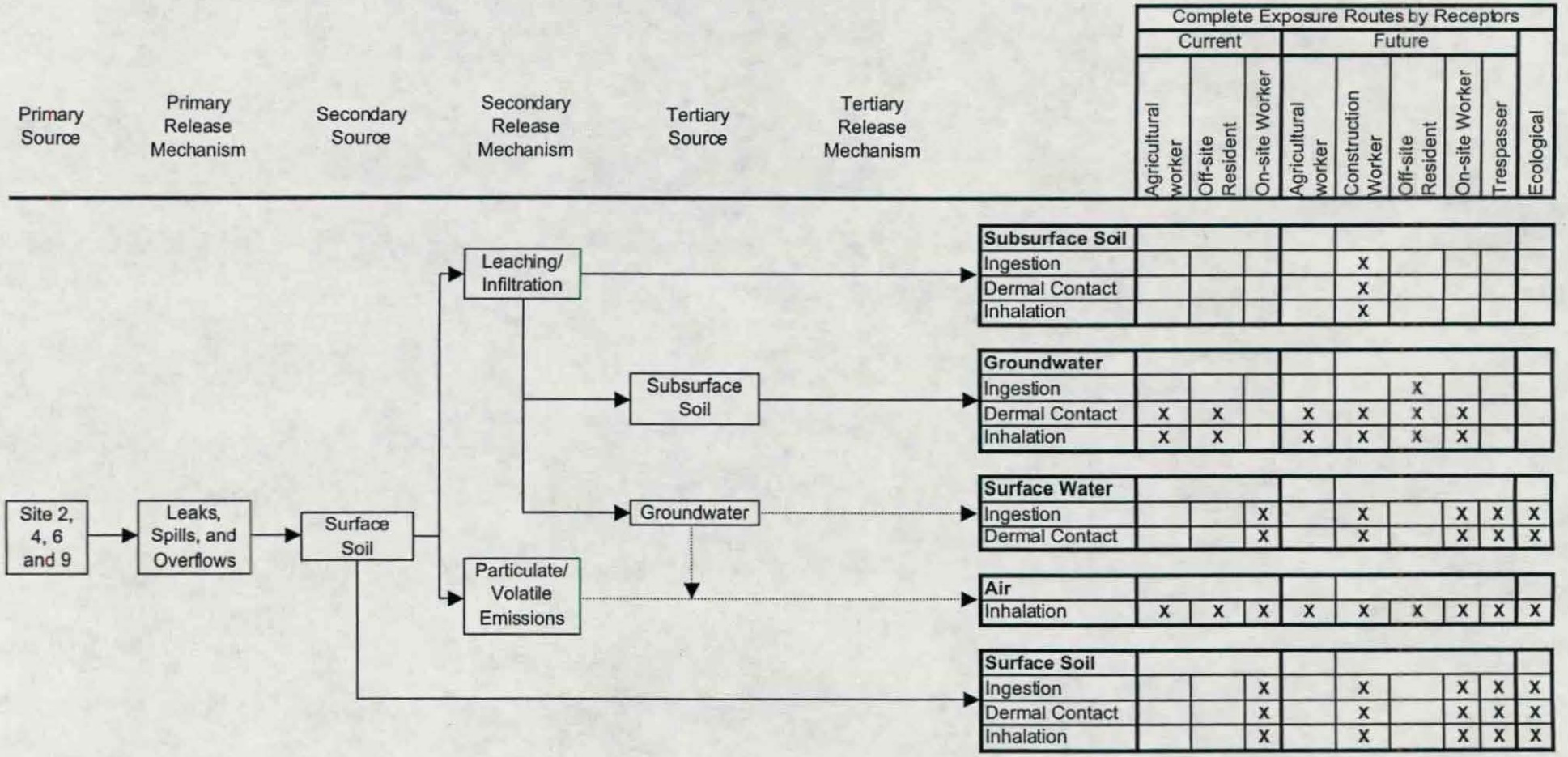
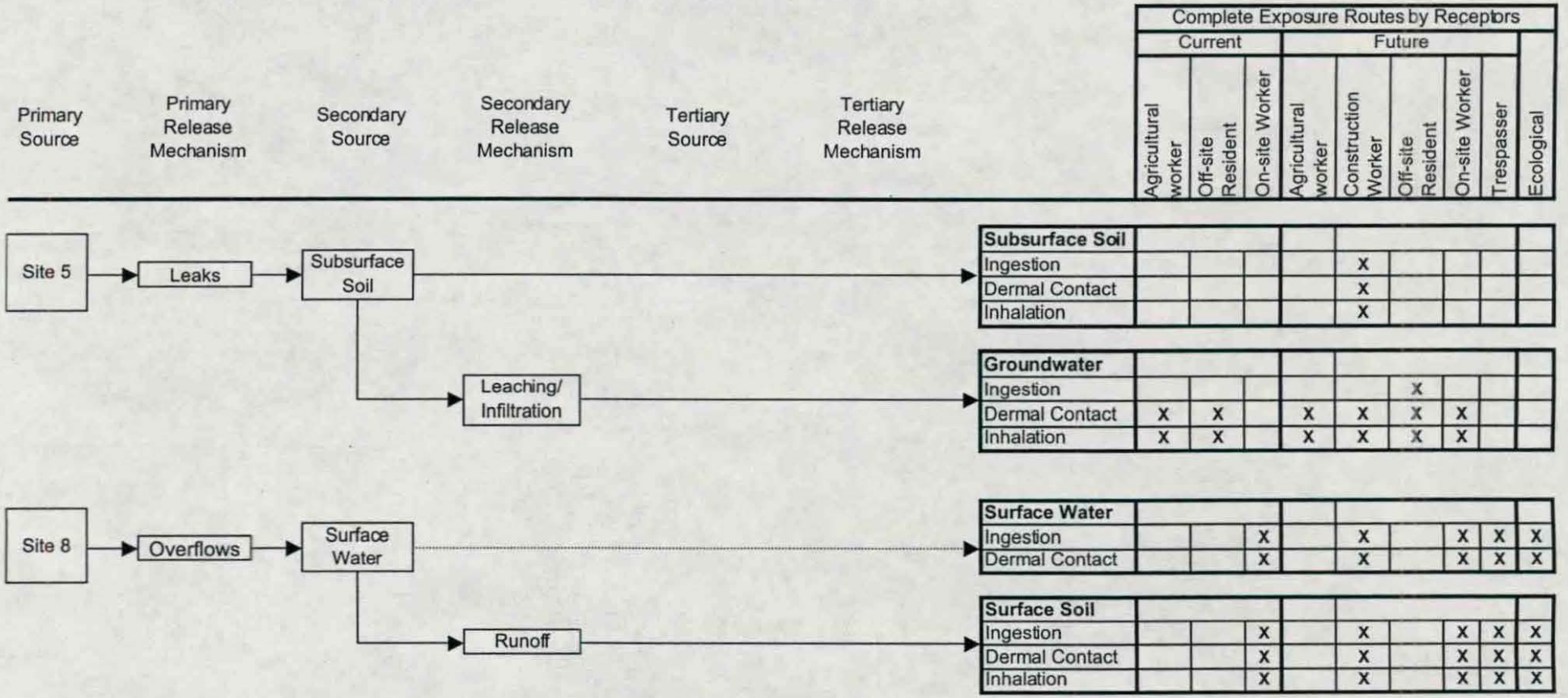


Figure 4[1,2]
Conceptual Site Model for Cedar Chemical Corporation



Complete Exposure Routes by Receptors	Current			Future					
	Agricultural worker	Off-site Resident	On-site Worker	Agricultural worker	Construction Worker	Off-site Resident	On-site Worker	Trespasser	Ecological
Subsurface Soil									
Ingestion					X				
Dermal Contact					X				
Inhalation					X				
Groundwater									
Ingestion						X			
Dermal Contact	X	X		X	X	X	X		
Inhalation	X	X		X	X	X	X		
Surface Water									
Ingestion			X		X		X	X	X
Dermal Contact			X		X		X	X	X
Air									
Inhalation	X	X	X	X	X	X	X	X	X
Surface Soil									
Ingestion			X		X		X	X	X
Dermal Contact			X		X		X	X	X
Inhalation			X		X		X	X	X

Figure 4[1,2]
Conceptual Site Model for Cedar Chemical Corporation



Complete Exposure Routes by Receptors	Current			Future					
	Agricultural worker	Off-site Resident	On-site Worker	Agricultural worker	Construction Worker	Off-site Resident	On-site Worker	Trespasser	Ecological
Subsurface Soil									
Ingestion					X				
Dermal Contact					X				
Inhalation					X				
Groundwater									
Ingestion						X			
Dermal Contact	X	X		X	X	X	X		
Inhalation	X	X		X	X	X	X		
Surface Water									
Ingestion			X		X		X	X	X
Dermal Contact			X		X		X	X	X
Surface Soil									
Ingestion			X		X		X	X	X
Dermal Contact			X		X		X	X	X
Inhalation			X		X		X	X	X

[1] The solid line represents the media available data indicate are contaminated.

[2] The dashed line represents media that may be contaminated, but data is not available to confirm.

DATA GAPS AND INFORMATION NEEDS

VI. DATA GAPS AND INFORMATION NEEDS

The following data gaps and information needs have been identified during the preparation of this report. Until these data gaps and information needs have been resolved, risk management decisions made about the Cedar facility will be incomplete.

FACILITY INFORMATION

- Information on the location and types of industrial facilities in the vicinity of the CCC site as well as the current closest residences would be useful for risk management decisions related to off-site groundwater contamination.

- It is unclear from the available file materials if the wetland (AOC 2) adjacent to Site 1 is located on the CCC site or is adjacent to the CCC site. This information would be useful to determine the potential receptors that may have access to this area.

- It is unclear from the available file materials which production unit manufactured 1,2-dichloroethane. This information would be useful to facilitate discussion regarding the source and associated release(s) of 1,2-dichloroethane at the CCC site.

- The available file materials do not indicate if and when the NPDES permit for the CCC outfalls (Outfall #001 and Outfall #002) was renewed.

PHYSICAL INFORMATION

- The 1996 FI report indicated that the prevailing wind direction is southwest, but that it only occurs 12.3 percent of the time. This information seems contradictory because prevailing wind direction should probably occur more frequently than 12.3 percent. However, it should be noted that this is probably not a significant data gap.

ECOLOGICAL INFORMATION

- Surface water and sediment samples should be collected from the wetland (AOC 2) to confirm that it has not been impacted with contamination released from the CCC site. If contaminants are detected in surface water or sediment, then ecological risk needs to be evaluated.

RELEASE INFORMATION

- Additional characterization of the perched, upper alluvial, and lower alluvial groundwater units (both on and off site) is needed to define the 1,2-dichloroethane and arsenic contamination, to the extent necessary, in order to compare data to appropriate standards. This information is essential to making appropriate risk management decisions and selecting the final remedy. Specific recommendations for further characterization of releases to groundwater could be developed in a sampling and analysis plan (SAP) designed to address the data gaps in this section. However, it should be noted that an enhanced site-wide monitoring well network (including both on- and off-site wells) and monitoring schedule will be necessary to monitor the contaminant levels in groundwater and ensure that the final remedy is effective.

- Correspondence files indicated that a groundwater extraction system was historically utilized at the CCC site. However, little information was found in available file materials regarding where the groundwater extraction system was installed, when it was operational, and the amount of contaminated groundwater recovered. This information may be useful while considering the appropriateness of potential groundwater remedial alternatives.

- It is recommended that available soil and sediment data be screened against remedial action objectives developed for the CCC site, particularly targeting Sites 1 through 4 and Site 9. Based on the results of the screening, a remedial investigation may be designed and implemented in order to fill any data gaps with regards to the extent of contamination (both vertical and horizontal extent) at each site. Subsequently, a corrective measure study is recommended to select the appropriate remedial alternatives for the contamination at each Site.

- Updated information on the SWMU and AOC descriptions may be useful since the majority of the information was obtained from 1988 RFA. Specifically, information on the status of SWMU 73 and SWMUs 75 through 80 would be useful to determine if additional investigation may be warranted. Some of these units may no longer be active or present at the CCC site.

LAND USE AND EXPOSURE INFORMATION

- Additional information about the use of the surrounding domestic wells would be useful to determine if there is the potential for off-site residents to come in direct contact with contaminated groundwater.

- The 1996 FI Report and 1999 Risk Assessment indicate that a fence surrounds the entire site. However, maps of the facility do not show a fence around the entire perimeter of the CCC site. The information provided in the aforementioned reports regarding the fence needs to be confirmed.

- Future plans for the CCC site would be useful in determining potentially exposed receptor populations, especially if the site is going to redeveloped for industrial or residential use.

RISK MANAGEMENT INFORMATION

- If contaminated surface water is detected as a result of investigations at AOC 2 or any other Site, the CSM should be updated to include completed exposure routes.

- Not all the completed exposure routes listed in Figure 4 (refer to Land Use Profile) were quantitatively or qualitatively addressed in the 1999 Risk Assessment (Ensafe, 1999) or 2002 Risk Assessment Addendum (Ensafe, 2002). For example, risks to indoor air from volatile emissions migrating from groundwater were not addressed. All completed exposure pathways need to be evaluated.

RISK MANAGEMENT PROFILE

VII. RISK MANAGEMENT PROFILE

A significant amount of site characterization information, especially with regard to groundwater contamination and sampling data are needed before appropriate risk management decisions can effectively be made. Therefore, this profile is currently incomplete.

1.0 Maximum Detected Concentrations

Maximum detected concentrations in groundwater (including both perched and alluvial groundwater zones) from the most recent groundwater sampling event (Ensafe, 2001) detected at on- or off-site locations were as follows: 603 µg/l of arsenic, 810 µg/l of benzene, 0.087 µg/l of beta-BHC, 180 µg/l of bis(2-chloroethyl)ether, 170 µg/l of chloroethane, 670 µg/l of 4-chloroaniline, 6,800 µg/l 1,2-dichlorobenzene, 24,000 µg/l of 1,2-dichloroethane, 0.24 µg/l of dieldrin, 170 µg/l of dinoseb, 2,000 µg/l of ethylbenzene, 480 µg/l of 4-methylphenol, 760,000 µg/l of toluene, 13,000 µg/l of xylenes, and 5 µg/l of vinyl chloride.

Maximum detected concentrations in sediment on site were as follows: 0.354 mg/kg of aldrin, 123 mg/kg of arsenic, 82 mg/kg of chromium, 1,200 mg/kg 3,4-dichloroaniline, 3.4 mg/kg of dieldrin, 1.6 mg/kg of toxaphene, and 5.3 mg/kg of pentachlorophenol (Ensafe, 1999).

Maximum detected concentrations in on-site surface/subsurface soil were as follows: 0.5 mg/kg of aldrin, 66.8 mg/kg of arsenic, 161.8 mg/kg of cadmium, 0.67 mg/kg of carbon tetrachloride, 13 mg/kg of chloroform, 0.63 mg/kg of dieldrin, 29,000 mg/kg of dinoseb, 12,000 mg/kg of 3,4-dichloroaniline, 170 mg/kg of 1,2-dichloroethane, 0.15 mg/kg of heptachlor, 380 mg/kg of methylene chloride, 111.7 mg/kg of mercury, 340 mg/kg of methyoxychlor, 4,000 mg/kg of propanil, and 14 mg/kg of toxaphene (Ensafe, 1999).

2.0 Magnitude of Risks

The 1999 Risk Assessment and 2002 Risk Assessment Addendum evaluated risk to current/future on-site workers, future on-site construction workers, future off-site agricultural workers, and future site trespassers. The following discussion summarizes the carcinogenic risk and hazard indices presented in the 1999 Risk Assessment and 2002 Risk Assessment Addendum.

The 1999 Risk Assessment quantitatively evaluated inhalation of volatiles and dust, incidental ingestion and dermal contact with surface soil exposure pathways for the current/future on-site worker population. Table 4 provides the total risk and hazard index across all media and all exposure routes for on-site worker by Site (Ensafe, 1999). Refer to the 1999 Risk Assessment for specific details on methodology Ensafe used to evaluate risk for current/future on-site workers.

Table 4 - Summary of Current/Future On-site Worker Cancer Risks and Hazardous Indices
Reasonable Maximum Exposure

Site	Total Risk Across All Media and All Exposure Routes	Total Hazard Index Across All Media and All Exposure Routes
1	1E-04	<1
2	3E-06	<1
4	8.3E-06	<1
6	5E-06	<1
9	2E-05	254

The 1999 Risk Assessment quantitatively evaluated inhalation of volatiles and dust, incidental ingestion, and dermal contact with surface/subsurface soil, incidental ingestion and dermal contact with sediment, and incidental ingestion and dermal contact with perched groundwater exposure pathways for the future on-site construction worker population. Table 5 provides the

total risk and hazard index across all media and all exposure routes for on-site construction worker by Site (Ensafe, 1999). Refer to the 1999 Risk Assessment for specific details on methodology Ensafe used to evaluate risk for future on-site construction workers.

Table 5 - Summary of Future Construction Worker Cancer Risks and Hazardous Indices
Reasonable Maximum Exposure

Site	Total Risk Across All Media and All Exposure Routes	Total Hazard Index Across All Media and All Exposure Routes
1	5.4E-05	21
2	6E-05	9
3	4.5E-07	40
4	3E-07	13
5	2.9E-07	<1
6	7.2E-08	<1
9	2E-07	91

The 1999 Risk Assessment quantitatively evaluated inhalation of volatiles and dust, incidental ingestion and dermal contact with surface soil, incidental ingestion and dermal contact with sediment exposure pathway for the future site trespasser population. Table 6 provides the total risk and hazard index across all media and all exposure routes for site trespasser by Site (Ensafe, 1999). Refer to the 1999 Risk Assessment for specific details on methodology Ensafe used to evaluate risk for future trespassers.

Table 6 - Summary of Future Trespasser Cancer Risks and Hazardous Indices
Reasonable Maximum Exposure

Site	Total Risk Across All Media and All Exposure Routes	Total Hazard Index Across All Media and All Exposure Routes
1	7E-05	<1
2	4E-07	<1

Table 6 - Summary of Future Trespasser Cancer Risks and Hazardous Indices Reasonable Maximum Exposure		
Site	Total Risk Across All Media and All Exposure Routes	Total Hazard Index Across All Media and All Exposure Routes
3	1.6E-05	<1
4	3E-06	<1
6	6E-07	<1
9	3E-06	82

The total hazard index across all exposure routes/pathways for an off-site agricultural worker inhalation of volatiles migrating from alluvial groundwater (from on-site monitoring well data) was 8,027 and the total risk across exposure routes/pathways was 5.2E-01 (Ensafe, 1999). The RME risk associated with inhalation of 1,2-dichloroethane for the future off-site agricultural worker was evaluated in the 2002 Risk Assessment Addendum using data from irrigation wells. The carcinogenic risk for the inhalation exposure associated with the 1,2-dichloroethane concentrations detected in the Blackhawk well (BHA-1) was 5E-06 and the hazard quotient was 0.1. The carcinogenic risk for the inhalation exposure associated with the 1,2-dichloroethane concentrations detected in the AGI-1 well was 7E-06 and the hazard quotient was 0.2 (Ensafe, 2002). It should be noted that dermal exposure was not included as pathway of concern for the off-site agricultural worker. As such, the risk to an off-site agricultural worker is expected to be significantly underestimated. ADEQ raised this issue in a comment letter dated May 14, 2002, regarding the 2002 Risk Assessment Addendum.

3.0 SWMU and AOC Priority for Corrective Action and Additional Investigation

The highest priority at the CCC site is to define the nature and extent of groundwater contamination both on-site and off-site. In addition, identifying, fully defining, and removing the source(s) of 1,2-dichloroethane and arsenic contamination as quickly as possible is an equally

high priority. Conducting remedial investigation and corrective measures study targeting Sites 1 through 4 and Site 9 is the second highest priority.

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VIII. REFERENCES

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